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ARMY PROCUREMENT RESEARCH OFFICE FORT LEE VA
TECHNICAL DATA PACKAGE IMPROVEMENT: PREPRODUCTION EVALUATION (P--ETC(U)
JAN 75 F W HELWIG, K D GRIFFITHS, K D NEWLIN

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TECHNICAL DATA PACKAGE IMPROVEMENT:
PREPRODUCTION EVALUATION (PPE)

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6 TECHNICAL DATA PACKAGE IMPROVEMENT:
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EXECUTIVE SUMMARY

1. Background. In recent years the Army, Navy, and Air Force have developed separate contract clauses that transfer responsibility to contractors for correction of errors, omissions, and discrepancies in TDP's. Although somewhat similar in purpose, the three sets of contract clauses differ significantly in application. Therefore, the ASPR committee concluded that (i) a single clause could not be developed to meet the requirements of the three services; (ii) the clauses were not deviations from established ASPR policy; and (iii) each service may develop and use its own provisions for transfer of responsibility for correction of errors, omissions, and discrepancies in TDP's. The Army's clause for this purpose is entitled "Preproduction Evaluation" (PPE). AMCP 715-6 defines PPE and provides the basis for its use throughout the procuring activities of AMC.

2. Problem. All "detail design" TDP's, even those that are in full conformance with Category E, MIL-D-1000, will contain at least a few errors, omissions, and discrepancies. Use of even the best TDP's have invited buy-ins and have resulted in delays and cost increases when TDP deficiencies are subsequently corrected for an equitable adjustment under the Changes clause. The inevitable errors, omissions, and discrepancies that occur in TDP's is the problem which the PPE concept addresses.

3. Objectives. The objectives of this study are to assess the success and problems experienced with application of the PPE technique, analyze pitfalls encountered in its application, and determine the desirability of continued use and actions necessary by AMC relative to standardization of the PPE concept.

4. Scope and Methods. The study data were derived from replies by AMC activities using PPE to letters of inquiry, interviews conducted with officials who participated in the formulation, use, and administration of PPE provisions throughout AMC and review of all 112 known PPE contracts awarded by major subordinate commands of AMC during the fiscal years of 1969 through the first quarter of 1973.

5. Conclusions and Recommendations.

a. This study concludes that PPE is not generally understood by personnel of the major subordinate commands. It was found that there is considerable disagreement as to how or even if PPE should be used. It was also observed that there is a lack of AMC guidance on the proper use of PPE and that local PPE instructions have evolved with differing interpretations and terminology which is confusing to industry and Government. Finally, it is concluded that it is desirable to continue use of the PPE concept, but the concept should be refined and improved by incorporating the recommendations of this study.

b. Ten specific guidelines for better application of the PPE technique are recommended by this study. Proposed definitions of compatibility type deficiencies and other basic and key PPE terms are included in Appendix A to this study. This study also recommends that several steps be taken to provide a better understanding and more consistent application of the PPE concept. These steps include the preparation, review, and approval of a standard PPE clause that may be tailored for individual procurements. A standard PPE clause with common terminology and provisions is needed to provide the framework for refinement and standardization of the PPE concept throughout AMC. Implementation of a standard PPE clause, tailored as required, would require inclusion in the AMCPI and a revision to AMCP 715-6. Also, on-site training classes/seminars would likely be needed to accompany implementation of a standard PPE concept. It is also recommended that any standard PPE type clause be renamed "Compatibility Engineering Change Responsibility" (CECR) to facilitate a common understanding of the concept and provide a better description of what the PPE concept encompasses. Finally, it is recommended that the PPE technique, as presently used or as it may be standardized, be used selectively and not indiscriminately.

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CHAPTER I INTRODUCTION

A. GENERAL.

This study is concerned with a contractual procedure, known as Preproduction Evaluation which has been used throughout the Army Materiel Command primarily since 1969. The study is one element, or task, within a set of efforts to achieve improvement in the areas of Technical Data Packages, which in turn is one category among several within the Army Materiel Command's recent project to achieve Improved Management of Procurement and Contracting Techniques (Project IMPACT).

PPE type contract provisions have been revised and refined in various ways since about 1965. AMC guidance for use of the procedure has been essentially limited to the information and sample clauses contained in AMCP 715-6. Within the framework of the pamphlet, MSC's have developed their own provisions, with differing sets of specific procedures tailored to accommodate local needs and interpretations.

B. BACKGROUND.

In recent years the Departments of the Air Force, Navy, and Army have developed and used contract clauses entitled respectively, Total System Performance Responsibility (TSPR), Total System Responsibility (TSR), and Preproduction Evaluation (PPE). All three sets of contract provisions attempt to allocate portions of responsibility to contractors for errors, omissions, and discrepancies in technical data. TSPR and TSR clauses address the acquisition and use of adequate technical requirements throughout the development, preproduction prototype, initial production, and follow-on production phases of the materiel life cycle for major systems procurements. Where the contractor participates in development of the requirements or has an opportunity to review and revise or refine the technical requirements, it is felt that a greater degree of responsibility can be fairly transferred. The Department of the Army's PPE provisions, on the other hand, are primarily focused toward procurements of items and equipments in the production phase where the Government already has possession of adequate technical requirements meeting the characteristics of a Category E, MIL-D-1000 TDP. In cases where PPE is applicable, the TDP should permit identical reproduction by a competent manufacturer without additional development and without recourse to the developer. Additionally, it is presupposed that the primary goal would be more effective attainment and realization of the benefits of shifting to a competitively selected source of supply. Therefore, while similar in intent the three sets

of provisions differ significantly in practice. After lengthy evaluation of combining the substance of the three clauses, the ASPR committee concluded to the effect that: (i) single uniform provisions would not suffice to meet the myriad possible contractual relationships of all three services; (ii) the provisions were not deemed to be deviations from the established ASPR policy; and (iii) each service should continue, if they so desired, to utilize their own provisions for the allocation of responsibility for errors, omissions, and discrepancies in technical requirements.¹

C. DEFINITIONS.

1. Preproduction Evaluation. For the purpose of this study, the term PPE is interpreted to be a technique used in selected fixed-price type production contracts for military design equipment which incorporates special exculpatory provisions to accomplish the following functions:

a. Acknowledge, rather than deny by implication, the potential existence of TDP defects.

b. Charge the contractor to be responsible for the risks associated with selected types of TDP defects.

c. Charge the contractor to evaluate the TDP throughout contract performance and identify and correct the selected types of defects by submissions of relevant engineering change proposals (ECP's) and implementation of approved ECP's.

d. Ask prospective contractors, before contract award, to preprice the estimated work and risks associated with the potential selected TDP defects so that adjustments of the established contract prices and delivery schedules will be unnecessary after contract award.

The PPE procedure for employing exculpatory language in production contracts is explained by the AMCP 715-6 dated May 1970, entitled "Preproduction Evaluation Contracts." The reader is encouraged to examine the pamphlet to form the basis for a better understanding of the analysis contained in this study.

2. Other Basic PPE Terms. The definitions of other basic terms are contained in Appendix A which should be of particular benefit to those readers who are not familiar with those terms that are basic to an understanding of the PPE concept.

D. PURPOSE FOR USING PPE PROVISIONS.

The main purpose for using PPE is to prevent undue delays and excessive costs in the use of an unproven TDP. Prior to the use of PPE, all TDP deficiencies were subject to equitable adjustment (*price and delivery*) under the standard Changes clause. However, recourse to the Changes clause produced the following undesirable consequences:

1. It encouraged buy-ins and offers from incapable firms.
2. It fostered untimely and ineffective identification and correction of Technical Data Package deficiencies, i.e., it has:
 - a. Induced a sense of disregard for the cost consequences of TDP deficiencies.
 - b. Permitted near apathy relative to specified delivery schedules.
3. Bred uncooperative attitudes on the parts of both Government and industry.

E. OBJECTIVES.

The general objectives of this study are to assess the degree of success experienced with applications of the PPE technique, analyze pitfalls encountered in application, and determine the overall desirability of continued use within AMC and actions necessary by AMC relative to standardization of the PPE concept.

F. METHODOLOGY.

The study data were derived from (i) replies to a letter of inquiry sent to many of the relevant organizations within AMC, a copy of which is contained in Appendix B; (ii) interviews conducted with officials who participated in the formulation, use, and administration of the PPE provisions throughout the AMC complex; and (iii) review and analyses of the relevant literature and contract files. The sample size of 112 contracts constituted all known contracts at the time of inquiry (Fall 1972) which contained PPE provisions.

Throughout the analyses of this study, AMCP 715-6 has served as the frame of reference or baseline for observations and comparisons of the PPE concept. Interpretations by the authors were necessary to identify the fundamental guidelines of the PPE theory due to differing methods of implementation by the several organizations.

Much of the data and examples presented in this study are not tied back to the major subordinate commands. A degree of anonymity was considered advisable since the ultimate objective of this study encompasses the desirability of continued use of the PPF technique and not its specific application.

G. ORGANIZATION OF REPORT.

The remainder of this report is framed within the project objectives. The underlying theory of PPE and its application within AMC are explained in Chapters II and III, respectively. Chapter IV analyzes the problems encountered in PPE application. Chapter V establishes the guidelines for improved application and standardization of the technique. And Chapter VI presents the summary, conclusions, and recommendations.

CHAPTER II
THEORY AND POLICY ON PPE USAGE

A. GENERAL.

Basic to an understanding of the theory behind PPE is the general problem of errors and omissions in the TDP's prepared for reprourement purposes. While it is desirable that TDP's be adequate, current, clear, accurate, and complete, it is known that they will contain errors and omissions. This chapter summarizes some of the inherent reasons for such TDP errors and omissions and includes a conceptual view of PPE as implemented throughout AMC.

B. TDP DEFICIENCIES.

1. The Reasons for TDP Deficiencies. AMC Regulation 70-46 provides that TDP's for effecting competitive production contracts are to be adequate, current, clear, accurate, and complete. Yet past experience provides ample evidence that even very high quality TDP's in fact do not fully comply with those descriptors. In complex procurements the individual data elements number in the thousands, tens of thousands and even hundreds of thousands, and it is not surprising that: (i) most, if not all, TDP's fall somewhat short of the desired goals due to the human element involved and the effect of the law of diminishing returns when attempts are made to perfect the TDP; and (ii) various production contractors perceive the TDP differently than Government personnel with regard to the desired goals. The reasons for the deficiencies stem from the preparation of the TDP's as well as from the way they are interpreted by contractors who are not familiar with the TDP's. The reasons for TDP deficiencies can be categorized in terms of the opposites to the stated goals of AMCR 70-46; that is, while the technical data package should be adequate, current, clear, accurate, and complete, it is known that in some respects it will be inadequate, outdated, discrepant, and that it will contain errors and omissions.

2. The Reason for Acknowledgment of TDP Deficiencies. In past "non-PPE type" procurement actions, many Government personnel felt that the natural imperfection of the TDP would be implied as contracts were effected and that assumptions of responsibility by the contractor would naturally follow. But as differences of opinion have arisen after contract award, the implication over the years has been held to be the opposite during numerous litigations including the implied warranty doctrine first established in the case of *Sperrin vs. United States* in 1918 and more recently in the case of *REDM vs. United States* in 1966. Since TDP deficiencies are expected to exist, and in view of the implied warranty

doctrine, if the Government desires to have the contractor correct the deficiencies, as part of the scope of work, without repetitive contract adjustments, it is necessary that the Government acknowledge the deficiencies before contract award.

3. Types of TDP Deficiencies That Fall Within the PPE Concept. AMCP 715-6 uses the word "compatibility" to define the deficiencies that are to be corrected by the contractor as part of his scope of work under a PPE contract. The word compatibility emanates from MIL-STD-480 and as used in the various PPE provisions refers to Code A, C, and some of Code D deficiencies as defined therein. It is suggested that the reader refer to AMCP 715-6, page B-2 and Appendix A of this study for more comprehensive definitions of a compatibility change and its relationship to MIL-STD-480. Compatibility most nearly describes the types of deficiencies encompassed by the PPE concept and has been adopted for use as a descriptive tool by all of the major subordinate commands. Table II-1 categorizes the names currently assigned to what this study calls Compatibility Engineering Change Proposals (CECP's) which are ECP's submitted by contractors to correct Compatibility Deficiency (CD's). (See Appendix A for a definition of CD's.) At the very least such differences may be confusing and misleading to both Government personnel and industrial firms—especially those who have many contracts with PPE provisions.

C. EXPECTATIONS OF PPE CONCEPT.

The major expectations of the PPE concept are centered around the purpose for PPE, i.e., to prevent undue delays and excessive cost in the use of an unproven TDP. To the extent that the foregoing benefits are achieved one would expect that requests for contract adjustment (price and/or delivery) would be few, rather than many, with valid, rather than questionable bases. Also any requests for price adjustment would be limited to few, if any, situations where the contractors sincerely believed that the definition of what constituted a compatibility deficiency has been exceeded. Furthermore, any requests for delivery extension would be accompanied by consideration to the Government, or at least plausible justification would be provided in support of the consideration offered.

TABLE II-1: NAMES EMPLOYED FOR COMPATIBILITY ENGINEERING CHANGE PROPOSALS*

Major Subordinate Command	Name Employed for ECEP's
ECOM	Compatibility Change ECP's and Production Evaluation Compatibility Change (PECC) ECP's
MECOM	Category II ECP's
MICOM	Category II ECP's, Category A ECP's, and Category II ECP's*
MUCOM	
Frankford A	Category II ECP's
Picatiny A	Class II ECP's, PPE Change, and Category II ECP's**
TACOM	Preproduction Evaluation Proposals (PPEP's)
WFCOM	Preproduction Evaluation Proposals (PPEP's)

*Study data was obtained during Fall of 1972 and before reorganization/combination of MSC's.

**Latest usage.

D. POLICY ON PPE USAGE IN AMC.

The primary source of policy guidance for the PPE procedure has been essentially limited to the conceptual discussions and sample clauses contained within AMCP 715-6. Based on this pamphlet, many MSC's have developed their own PPE guidance documents which are identified in the following Table II-2.

Table II-2: PPE GUIDANCE DOCUMENTS ISSUED TO SUPPLEMENT AMCP 715-6*

Major Subordinate Command	Guidance Documents
ECOM	IMPI 33-69 dated 5 December 1968 plus updates; Production Engineering Procedure No. 95 dated 23 August 1971; Production Engineering Procedure No. CM-1 dated 6 February 1973; DF, AMSEL-PP-PP, dated 2 March 1973, Subject: PPE Contract Special Provisions.
MICOM	IP Instruction 15-72 dated 14 June 1972.
MUCOM	
Frankford A	FA Regulation 715-38 dated 3 December 1970.
Picatinny A	PA/HISA Regulation 70-25 dated 9 August 1972.
TACOM	Draft TACOM Pamphlet on PPE and Offeror's Guide for Evaluation of PPE change proposals.
WECOM	AWC Procurement Instruction 4-5200 and letter dated 28 October 1970.

*Most of the study data was obtained during Fall of 1972 and before reorganization/combination of MSC's.

Although the above identified MSC's have supplemented AMCP 715-6 with their own local instructions, the existence of a PPE peculiar instruction was not observed at the other organizations where the PPE technique has not been used. Evidence indicates that PPE guidance from an AMC point of view, is fragmented, inconsistent, not comprehensive, and is sometimes contrary in important areas. In some cases the local instructions were apparently generated from the engineering side of the MSC's and from the procurement side in other cases. All of the PPE instructions have been pioneering in nature, especially AMCP 715-6.

The PPE technique represents a significant and complex departure from practices of the past and instructions concerning its application are understandably controversial and less than perfect until refinements are effected. At present it should be pointed out that PPE implementation procedures do differ throughout AMC with respect to terminology employed, methods of pricing, goals, areas of applicability, responsibilities for initiation of the necessary actions, classification of compatibility change schemes, and in numerous other ways.

The problems resulting from inconsistent policy in the application of PPE will become apparent in the following chapters which review the application of the technique throughout AMC.

TABLE III
TYPICAL POLICY DIFFERENCES BETWEEN THE PROVIDERS

Contract	Number of contracts by condition type			Total
	Type I	Type II	Type III	
Contract A	1	0	0	1
Contract B	1	0	0	1
Contract C	1	0	0	1
Contract D	1	0	0	1
Contract E	1	0	0	1
Contract F	1	0	0	1
Contract G	1	0	0	1
Contract H	1	0	0	1
Contract I	1	0	0	1
TOTAL	9	0	0	9

**CHAPTER III
OBSERVATIONS ON PPE APPLICATION THROUGHOUT AMC**

A. GENERAL.

This chapter addresses the implementation and actual usage of the PPE technique by MSC's and provides statistical information and observations concerning the use of PPE prior to contract award (Procurement Solicitation Phase) and after contract award (Contract Administration Phase).

B. PROCUREMENT SOLICITATION PHASE.

1. Types of Solicitation Employed with PPE Provisions. A total of 112 contracts at the MSC's representing the total population of contracts with PPE provisions that were in existence within AMC were analyzed during this study. Table III-1 depicts the types of solicitations that resulted in the award of these 112 contracts. It is interesting to note the diversity of solicitation types used. Perhaps this indicates that PPE may be used with any method of solicitation and that which fits best should be utilized. However, some qualifying observations concerning the use of the PPE concept during the solicitation phase are set forth below.

TABLE III-1: TYPES OF SOLICITATIONS EMPLOYED WITH PPE PROVISIONS

Major Subordinate Command*	Number of Contracts by Solicitation Type				
	IFB	RFP	RFQ	2 Step IFB	Total Observed
Command A	2	12	—	—	14
Command B	3	3	1	4	11
Command C	4	2	—	—	6
Command D	1	2	1	—	4
Command E	—	—	—	2	2
Command F	56	17	1	1	75
AMC TOTAL	66	36	3	7	112

*Specific MSC's not identified for purposes of this study.

2. Observations on Use of PPE During Solicitation Phase.

a. Invitation for Bids (IFB's) (Other than two-step IFB's). AMCP 715-6 advises against use of the IFB's type, yet, 66 IFB's were observed. Some personnel interviewed expressed surprise upon learning that IFB's had been issued with PPE provisions. The analysts were also surprised to find such a high incidence of IFB's. There seems to be a contradiction in issuing an IFB with PPE provisions since (i) firmness of specifications is one of the primary requisites for use of formal advertising; and (ii) use of PPE provisions by definition, constitutes an express acknowledgment of the absence of firm specifications, even though the relative magnitude of unfirmness is not addressed. Where there is an unfirmness condition, it would seem appropriate to inform prospective contractors (i) that a low quality TDP was involved; (ii) that significant departures from the TDP might be necessary to overcome the deficiencies and to achieve stated manufacturing and equipment performance objectives; and/or (iii) that substantial development effort may be necessary relative to certain portions of the product design. In these cases, the implication that the TDP was firm, by virtue of employing formal advertising techniques, would seem to be quite improper and unfair. In at least one case (without PPE) the ASBCA was asked to rule relative to the magnitude of risk which had flowed to the contractor, and in this case, the solicitation type was one of the critical considerations. The set of considerations is indicated in the following excerpt:

. . . that such a shift of risk was not intended is indicated by the fact that:

- (1) the design drawings were familiar and prepared by the Government;
- (2) the contract was formally advertised and awarded as a production contract rather than as a research and development contract;
- (3) there is no provision for the specifications to take precedence over the drawings;
- (4) there is no express provision requiring contractors to make design changes needed to meet performance requirements; and
- (5) the contract contains the standard "Changes" clause (which courts will not allow to be deprived of its ordinary coverage without express contract provisions calling for that result).¹

Even though nonconclusive, another indicator was observed from the findings of a recent study of some of Command F's procurements wherein it was reported that out of 19 claims submitted during a particular span of time, 15 were against contracts awarded after IFB solicitations.² Therefore, it appears reasonable that use of the IFB technique would not contribute to a better understanding concerning the amount of risk to be transferred. The IFB solicitation does not encourage dialogue and is not considered to be an effective method for communication of the relative magnitude of specification firmness.

b. Requests for Proposals (RFP's). Negotiated procurements, on the other hand, solicited by use of Requests for Proposals provided a better opportunity for extensive two-way communication about the procurement history of the item, the current status of the TDP as a production baseline, the nature and extent of coverage of the PPE transfer of responsibilities, and the contractor's intended role. Thirty-six out of the 112 contracts observed were effected by RFP solicitations. It is important to note (i) most of the contracts observed at Command A were effected by RFP's; (ii) of the 17 RFP's observed at Command F, most were initial production contracts where subsequent production problems were expected; and (iii) of the seven RFP's at Commands B, C, and D, it appeared that a need for extensive communication was anticipated.

c. Requests for Quotations (RFQ's). RFQ's are not extensively used by MSC's of AMC. Although the inclusion of PPE provisions in an RFQ may be appropriate, observations will not be made since the use of RFQ's is necessitated by factors outside the direct subject matter of PPE.

d. Two-Step Formal Advertising. The use of Two-Step Formal Advertising solicitations with PPE provisions, illustrated a positive and deliberate attempt to assure effective two-way communication and mutual understanding of the pertinent aspects of the history and status of the TDP, the peculiarities of the PPE concept, and the intended contractual relationship. During the first step, at Commands B and E, prospective contractors were asked to evaluate the TDP in considerable detail and to submit sample PPE submissions of compatibility type engineering change proposals. This provided the Government an opportunity to draw some conclusions about the prospective contractors' level of understanding and to clarify misconceptions prior to soliciting price proposals. The PPE provisions, however, were only one of the peculiar or unique circumstances which justified use of the Two-Step IFB approach; and the approach would be unnecessary without other justification factors, unless of course the procuring activity considered it to be the only way to effect the necessary level of dialogue.

e. Employment of Other Communicative Techniques During the Solicitation Phase. The asserted purpose for employing other communicative techniques during the solicitation phase is to supplement that which can be achieved via the selected solicitation method to assure understanding about the peculiarities of: (i) the PPE concept and specific PPE provisions; (ii) the individual procurement action and relevant status of the TDP; and (iii) the magnitude of the risks intended to flow to the production contractor. From an overview, it is observed that the following six techniques were employed to achieve this purpose: (i) solicitation of technical proposals; (ii) presolicitation conferences; (iii) post award conferences; (iv) allowances for extra lead time to review the TDP; (v) in-depth pre-award surveys with emphasis on PPE; and (vi) use of a special letter or certificate of understanding to be signed by the contractor at contract inception. Observations about each of these techniques will now be briefly addressed.

(1) Solicitation of Technical Proposals. This technique was employed on a limited number of solicitations at Commands A and C to supplement price proposals. It was not observed in solicitations at Commands D and F. The Two-Step IFB solicitations at Commands B and F by definition included technical proposals as well as price proposals. The effectiveness of this technique is dubious. For example, in one solicitation two technical proposals were received. One offeror's technical proposal adequately covered the conception of PPE and provided a plan for conducting the PPE work, while the other offeror's technical proposal did not mention PPE. The latter offeror apparently had either discounted the significance of the concept or had misunderstood it. It may be concluded that unless technical proposals are otherwise required, the necessary exchange of PPE information can be effected equally well with or without a technical proposal. This is true because in most cases a face-to-face exchange of information is required to achieve mutual understanding. However, the use of technical proposals where otherwise justified seems to provide a very convenient method for an in-depth exchange of information, most of which could be in writing to serve as a back-up document to the contract.

(2) Presolicitation Conferences. Presolicitation conferences are expensive, time consuming, and may confuse rather than inform. However, when needed, they have provided an excellent forum to achieve the three previously listed communication goals. AMCP 715-6 gives an exemplary example of a PPE speech, which was used by Frankford Arsenal and Picatinny Arsenal in several procurements.³ Commands A and C use the presolicitation conference technique in most of their PPE solicitations; Commands B and F either already use it or state that they probably will use it except when the Two-Step IFB solicitation is used. Command F conducted a few presolicitation conferences during their PPE trial period, but quit after it was felt that industry had become accustomed to PPE. Most of Command F's contracts, therefore, were not affected after a presolicitation conference. Even if industry is acquainted with the PPE concept, as employed by Command

F, it is questioned how relevant information about the TDP status, procurement history, and intended exclusions and inclusions of responsibility were communicated so that mutual understanding could be effected about the magnitude of risk to be assumed. To expound on this area of concern, at Command A (where presolicitation conferences were held) one of the main topics of the conferences was whether specified performance levels had been met (including examination of some of the available corroborating evidence), and to what extent a contractor would be responsible for performance levels not previously attained. Admittedly, a tendency of the Government personnel at such conferences was to make assertions that sometimes exceeded the facts, especially when the item was type classified. Also this tendency has apparently caused problems at Command A. But the questions are: Does not Command F experience similar situations? If so, how does the information flow to the prospective contractors? Even though highly subjective, the general assessment was that the information was often not communicated.

(3) Post Award Conferences. Although not occurring during the procurement solicitation phase, it is deemed appropriate to mention that Command F has utilized post award conferences between PCO representatives and the selected contractor. One of the subjects discussed at many such conferences was the PPE technique. While the analysts do not take issue with having such conferences when otherwise needed, it does seem unwise that significant communication concerning PPE responsibilities took place subsequent to rather than prior to award. In one instance, during a post award conference the contractor obviously needed extensive clarification concerning the "type" deficiency that would be processed under the Changes clause. In another instance, the contractor was surprised at the magnitude of risk. He stated that he could not proceed with the contract in view of the new knowledge gained during the post award conference. Numerous other similar situations were observed and each time the relevant question seemed to be, "Isn't it too late to be discussing these matters?"

(4) Allowances for Extra "On the Street" Lead Time. AMCP 715-6 suggests that "longer than normal" solicitation lead time should be provided when PPE provisions are used. If 30 days are considered "normal," probably a minimum of 45 or preferably 60 or more days should be allowed with PPE. The inferred purpose for the extra lead time allowance is not to identify defects during the pre-award phase, but rather to encourage a thorough review to attain maximum awareness and appreciation of (i) the particular nature of the TDP; (ii) the associated problems; and (iii) the amount of risk to be assumed under the stringent PPE provisions. Without proper assessment of the amount of risk, a prospective contractor may be unable to financially survive if selected for award. At least the success of such a contract would be doubtful. In general, several meaningful points were apparent, as follows:

(a) Commands B and E use of Two-Step IFB's provided what appeared to be ample "TDP review time." Furthermore, the sample submissions of compatibility type engineering change proposals provided a two-way exchange of information during the critical solicitation phase. Under these procedures, a competent prospective contractor could hardly avoid the requisite TDP review. Also it is almost certain that he would become apprised of the general magnitude of the risk involved.

(b) Similarly, in most of the RFP's employed both with and without technical proposals, 45 days solicitation time was observed and in several cases 60, 75, and even 90 days were allowed.

(c) When IFB's were used, however, a standard response time of 30 days was provided for review of the TDP. Not infrequently the bid opening dates were extended from 30 days to 40 or 45 days or longer, but prospective contractors had to request the extension and provide justification. At Command F, several individuals concurred with the need for longer than normal response time with PPE. However, since time extensions were normally requested and granted, an initial allowance longer than 30 days was not considered necessary.

(d) Many letters from industry, prepared both prior to and after award, were observed wherein complaints were expressed that the allowable lead time was too short for a realistic review of the TDP. Such complaints are almost commonplace occurrences and are expected in some cases. But the tone of several complaints took on a new and different significance vis-a-vis the PPE shift of responsibility. The observation is that when the Government utilizes the PPE provisions, a savings of a few days "on the street" review time may be very costly and counterproductive. The following excerpt regarding a contract litigation while not directly related to PPE, nevertheless seems relevant to the lead time issue when PPE provisions are employed:

A bidder's duty, by contrast, must be measured by the pressures of time and competition—not in the calm meditation of hindsight. There are limits to the amount of study he must do to determine the Government's requirements.⁴

(5) Conduct of Pre-award Surveys. The main function of the pre-award survey is to determine a prospective contractor's capability to perform a proposed contract. But it can also serve to clarify and emphasize key aspects of a procurement including PPE.

provisions. Both functions were performed in many of the observed cases but were not performed in others. The pertinent general observations concerning the coverage of PPE provisions during a pre-award survey are as follows:

(a) In approximately 25 percent of the contracts, considerable emphasis was placed during pre-award surveys on the transfer of responsibility under PPE provisions. The quest was twofold: (i) to measure the capability of the prospective contractor; and (ii) to assess whether he understood the procurement action, the PPE concept and the risks to be assumed. In most, if not all, of these cases the PCO was represented in the pre-award surveys.

(b) In at least 20 percent of the contracts, the evidence indicated that special PPE emphasis did not occur during pre-award surveys.

(c) In the remaining 55 percent of the contracts it was impossible to determine whether special PPE emphasis did or did not occur.

During review of the above contracts it was observed in the case of Command F that the pre-award survey team did not have PCO representation. This created a problem because DCAS personnel were generally not sufficiently familiar with the PPE approach to effectively emphasize its unique aspects to prospective contractors. However, intensive and impressive analyses were conducted during a few of the pre-award survey efforts. On the other hand, about 50 percent of the contracts could probably have been effected with greater emphasis on the peculiarities of PPE, the nature of the TDP, and the amount of risk to be assumed. Some of the major theoretical benefits of the PPE concept are that it should encourage the "right" prospective contractors, discourage the "wrong" ones (i.e., those who would buy in and who do not have the general capability to perform), and markedly improve the resulting contractual relationships with the selected contractor. Furthermore, when presolicitation conferences and other communicative techniques are not utilized due to the time and expense involved, or when awards are made primarily on the basis of price without extensive negotiation, a thorough pre-award survey may be the only effective method of communication. It follows that (i) a thorough pre-award survey with emphasis of PPE should afford an important opportunity to effect realization of these benefits; and (ii) in the absence of such a survey the benefits may be lost. Perhaps more importantly if contractors make erroneous assumptions about the amount of risk to be assumed, not conducting a pre-award survey may be counterproductive to the success of the contract.

(6) Letter/Certificate of Understanding. In one of Command A's contracts, an extensive dialogue took place prior to award relative to the PPE procedure, the individual procurement action, and the contractor's role in assuming PPE responsibilities. The exchange was concluded with a letter written and signed by a high official of the contractor's firm, which stated that the contractor thoroughly understood his role under the PPE provisions. During contract performance a "show cause" letter was issued by the Contracting Officer when the first article delivery date was not met and when the balance of the delivery schedule was in jeopardy. Interestingly, a part of the contractor's response was that he had not fully understood nor agreed to the risks relative to PPE at contract inception, notwithstanding the previous letter. It would seem, however, in event of litigation, that the contractor's letter would be a very important document in determining the initial agreement of the parties.

AMC usage of PPE during the procurement solicitation phase has been covered. And now the study will review AMC PPE usage in the Post Award or Contract Administration Phase.

C. CONTRACT ADMINISTRATION PHASE.

1. Number of PPE Contracts by Major Subordinate Commands, Types of Contracts, and Dollar Values. In response to letters of inquiry, six AMC procurement activities including the arsenals furnished data in support of their experiences with PPE provisions. The number of relevant contracts by year and the participating organizations designated by Commands A through F, are shown in Table III-2; the total approximate dollar value of the contracts at contract inception, appears in Table III-3 and the number of contracts by contract type is shown in Table III-4.

TABLE III-2: NUMBER OF CONTRACTS WITH PPE PROVISIONS BY MAJOR SUBORDINATE COMMAND BY FISCAL YEAR

MSC	Number of Contracts					Total
	65-69	70	71	72	73*	
Command A	5	3	4	2	—	14
Command B	4	2	3	2	—	11
Command C	3	1	2	0	—	6
Command D	1	1	1	1	—	4
Command E	0	1	0	0	1*	2
Command F	8	12	24	31	—	75
TOTAL AMC	21	20	34	36	1	112

*Contracts were surveyed in Fall 1972 and one contract in process was awarded with a FY 73 number. Other FY 73 actions are not listed above.

TABLE III-3: APPROXIMATE DOLLAR VALUE OF CONTRACTS WITH PPE PROVISIONS AT INCEPTION
BY AMC MSC BY FISCAL YEAR

Major Subordinate Command	Approximate Dollar Value						TOTAL
	65-69	70	71	72	73*		
Command A	\$ 14,405,961	\$ 1,988,183	\$ 22,490,847	\$ 1,892,995	-	\$ 40,778,719	
Command B	235,708,394	6,260,287	168,082,498	12,859,706	-	422,910,885	
Command C	2,615,812	6,732,050	7,042,285	0	-	16,340,147	
Command D	517,420	144,820	448,180	446,282	-	1,556,702	
Command E	0	17,395,445	0	0	21,060,000	38,455,455	
Command F	27,166,868	17,252,859	30,958,164	15,133,637	-	90,511,528	
TOTAL AMC	\$280,414,455	\$49,773,664	\$224,022,707	\$30,332,620	\$21,060,000	\$610,603,426	

*FY 73 Contracts were not reviewed except for one in-process at Command E.

TABLE III-4: NUMBER OF CONTRACTS BY CONTRACT TYPE

MSC	CONTRACT TYPE					ADDITIONAL DATA	
	FFP	FPIF	CPIF	TOTAL	Multi-Year PRO	Letter Contracts	
Command A	10	4	-	14	1	-	
Command B	10	-	1	11	2	2	
Command C	6	-	-	6	1	-	
Command D	4	-	-	4	-	-	
Command E	2	-	-	2	-	-	
Command F	75	-	-	75	11	-	
TOTAL AMC	107	4	1	112	15	2	

2. Observations on Use of PPE in Contracts. Based on data provided by the six MSC's which were obtained during field visits and interviews, the following observations are pertinent.

a. Command F has used PPE provisions in significantly more procurements than other commands; a total of 75 contracts were observed. Although Commands A, B, and C have fewer contracts than Command F, PPE provisions have been employed on most of their major relevant procurements. Both Command D and Command E have employed the PPE technique, but they have also frequently chosen not to use it. For example, it is conceivable that Command D might have applied PPE on 40 procurements rather than four during the past few years and Command E on 20 instead of two. In short, some commands are using PPE regularly and others show less enthusiasm in its use.

b. Table III-3 tabulates the total dollar value of the 112 MSC's contracts with PPE provisions during the fiscal years of 1965 to 1973. From Table III-3 it can easily be calculated, based on the number of PPE contracts and their total dollar value, that the contracts that employed the PPE concept averaged \$5,451,816. The largest dollar value was observed at Command B where PPE was applied primarily on major programs. Similarly, Commands C and E PPE procurements are large dollar value contracts. At Command F the dollar size per procurement action is less but the pattern is the same, i.e., the PPE technique has been applied to procurements of significant dollar value. It has not generally been applied to minor items or to stock fund procurements.

c. Table III-4 categorizes PPE contracts by the type of contract. From Table III-4 it is clear that most applications of the PPE technique were with contracts of the Firm Fixed-Price (FFP) type; However, other contract types, i.e., Fixed-Price Incentive (FPI) and Cost-Plus-Incentive-Fee (CPIF), were also employed.

d. Several of the organizations solicited during the conduct of this study did not employ the PPE technique. Inquiries to determine their rationale for nonuse of PPE resulted in a vague, rather than definitive, set of explanations. Some of the activities solicited were not engaged in procurements where PPE provisions would be applicable. Other organizations, however, could probably have found areas of applicability but did not—for reasons which were assessed to be primarily a lack of familiarity and understanding of the benefits and procedures. Personnel at certain activities expressed a strong interest and desire for more positive guidance and indicated that some "in-house" differences of opinion had to be reconciled before the concept could be utilized. Also, one activity expressed a desire for more guidance, especially the applicability of the concept to procurement actions concerned with transitioning from development into production.

3. Observations on Price Predetermination. Price predetermination which compensates the contractor for correcting TDP deficiencies under the PPE concept is necessary and was obviously performed before award of the 112 contracts observed. The ability of a contractor to predetermine (estimate) a price for PPE, i.e., to project the cost of correcting probable TDP errors or deficiencies, is established by a Comptroller General decision.⁵ Based on field visits, the following observations on price predetermination are made:

a. Over half of the 112 contract files reviewed contained complaints from contractors (either prior or after award) concerning the difficulties of predetermining a price. Many of the contractors asserted that it was unreasonable to require prospective contractors to make such estimates and to be responsible for the accuracy of the estimates, especially when the allowable TDP review time was short, or when in-depth communication was not conducted about the particulars of the TDP.

b. Post award review of contract files revealed that a few contractors alleged that they (i) had grossly underestimated costs and/or misunderstood the amount of responsibility involved; (ii) had not intended to enter the same relationship that was apparently intended by the Government; and (iii) had no recourse but to demand consideration of these facts by contract adjustment, notwithstanding the existence of the PPE provisions in their contracts.

c. A near consensus of opinion by both Government and industry is that it is not easy to predetermine the proper price for PPE. The number of potential defects, when they are discovered, and their cost and time impact are simply unknown factors at the inception of a contract. Since equitable adjustments are unavailable, the predetermined price for the estimated quantity of work and risk depends upon the competitive desires of a prospective contractor, his interpretation of the TDP and the way he plans to manage his contract.

d. Furthermore, there is not a consensus throughout AMC concerning the type or amount of work to be priced. For example, some personnel perceived the need for an increased contingency factor while others felt that contract prices already contain contingencies to accommodate PPE type risks. Some personnel felt that the cost of conducting the TDP evaluation (the paper study) comprised the bulk of additional efforts and added costs while other personnel felt that a TDP must be reviewed comprehensively with or without PPE provisions. In addition, others perceived the need for a marked increase in the estimated costs for scrap and rework effort while others felt that such costs would be included in the "normal" production unit price; and so forth.

4. Observations on Price Separation and Prices Proposed for PPE. In overview, there are two distinct camps concerning the need for separate pricing of PPE, i.e., those who believe it should be separated and those who do not.

a. Most of the procurement activities endorse the principles of price separation for PPE. But at least one does not. At Command A, the price was separated in most of their contracts (in one case the lack of a separate Contract Line Item Number (CLIN) was considered to be an administrative oversight). Table III-5 illustrates the observations relative to this point. While only one Command B contract appears in Table III-5, the "PPE price" was evident to Command B personnel in several other contracts. For example, in two different Command B contracts not shown in Table III-5, the visible prices were: (i) \$73,000—which represented about 1½ percent of the contract value; and (ii) \$796—which was about 1 percent of the item unit cost of \$66,112. Although not observed directly, such visibility may have also been the situation in the two Command E contracts. Command C had PPE prices separated in five out of six contracts; at Command D the ratio was two with and two without. However, one of the two Command D contracts without a separate CLIN for price was structured to include a separate price, but was reduced to zero dollars during price negotiation. (This was perceived to be a misunderstanding of the rationale of assuring that reasonable payment is estimated for PPE responsibilities. Rather than eliminating the price for the nominal sum proposed in that instance, the price for the hardware item could have been reduced accordingly.)

b. While the totals shown in Table III-5 list only 18 PPE price separations out of the 112 observed contracts, it should be noted that the proportion is misleading because most of the PPE contracts were at Command F where, as a matter of command policy, there was a decision not to separate prices for PPE. Several personnel at Command F countered by asking the following question: "What do you do with PPE prices, other than file it away as nice to know information?" That question seemed to be typical of the PPE philosophy at Command F. Therefore, at Command F prices were not separated either as a distinct contract line item or as a negotiable cost element; in fact the majority of the contracts were effected by IFB solicitations which precluded negotiation.

TABLE III-5: SEPARATION OF PPE PRICES BY LINE ITEM

Major Subordinate Command	Number of Contracts With PPE as a Separate CLIN	PPE Prices (\$)	Average Per Contract (\$)	Total Contract Value at Inception (\$)	PPE Prices as a Percent of Contract Value at Inception (%)
Command A	10	1,004,049	179,839	19,375,390	5.18
Command B	1	39,004	39,004	3,243,806	1.20
Command C	5	1,06,291	21,258	15,519,649	8.67
Command D	2	9,200	4,600	662,249	1.38
Command E	0	N/A	N/A	N/A	N/A
Command F	0	N/A	N/A	N/A	N/A
TOTAL AMC	18	1,158,544	64,363	39,081,083	2.96

c. On the average in 18 cases, Table III-5 indicates that about 3 percent of the initial contract price was estimated for the work and risks associated with PPE provisions. The data tends to be more informative when the following points are considered:

(1) Command A's contracts were primarily for initial production where specified equipment performance characteristics served as the controlling feature of the contract relationship. Furthermore, extensive communication ensued concerning each TDP and the potential hazards associated with the contract were emphasized prior to contract award. The concern was that contractors may have underpriced rather than overpriced the PPE tasks. Also, Command A's contracts, at least in part, had a "proof" quantity of hardware interrelated with the price for the evaluation work and risks. To make a direct comparison, it would be necessary to isolate the cost attributable to the proof quantity.

(2) Commands B and C's equipment were characterized by large unit prices in comparison with some of the other commands, and in addition some of the procurements were repeat buys. Furthermore, the transfer of responsibility at Command B was largely limited to "manufacturability and fit" rather than attainment of performance. About three of the Command C contracts were also similarly limited. Therefore, since the relationships were less stringent, one could expect the price to be less.

d. In most of the cases the price separations, for PPE, covered a wide range. This situation was not unexpected but it appeared that some prospective contractors did not understand what they were pricing. Within the competitive zone of consideration, in typical situations, the range of unit prices for equipment tended to form a cluster while the prices for PPE varied more widely.

CHAPTER IV PROBLEMS AND PITFALLS IN APPLICATION OF PPE

A. GENERAL.

During the course of this study many problems and pitfalls in the application of PPE were recorded by the analysts. However, the categorization of these problems and pitfalls was difficult because some problems, e.g., improper use of PPE, have created a chain reaction of additional problems and pitfalls. Also some of the problems and pitfalls resulted from the way the PPE concept is presently understood and interpreted by Government and industry whereas other problems resulted from the administrative procedures that are contained within the many diverse PPE instructions and clauses now in use. To avoid a quagmire of analyses, this chapter separates problems and pitfalls into three categories. The first category involves legal and contractual problems which should be considered and must be overcome before any new procurement concept such as PPE is successfully employed. The second category entitled "Major Problems in the Application of PPE" identifies the significant problems that have prevented effective application of the PPE concept. These problems are considered critical and their existence has limited the successes of PPE and has contributed to many of the minor pitfalls which are discussed in category three. This third category provides a brief summary of some minor pitfalls that have been encountered in the application of PPE. A detailed analysis of all pitfalls, many insignificant, was considered of questionable value since most of the minor pitfalls are directly attributable to major problems.

B. LEGAL AND CONTRACTUAL PROBLEMS.

1. The Consistency of Legal Decisions. When disputes have arisen between a contracting officer and contractor, the courts and boards have almost consistently upheld the contractor's claims. This statement also holds true notwithstanding the existence of TDP disclaimers and other evidence to show the absence of an intended implied warranty.¹ The rights of contractors under the standard Changes clause are well established in tradition and will continue in the absence of a very clear contractual understanding to the contrary. Furthermore, it is generally held that the Government cannot abdicate its responsibility in toto under any manner of exculpatory language. It is a party to its contracts and that role inherently carries both express and implied responsibilities. Also without evidence of mutual understanding to the contrary, the ASBCA and court decisions have upheld both the express and implied terms of contracts the way they were written, rather than the way they were meant to have been written. If a detailed specification of work was furnished, such as an

engineering drawing, it was implied that it would be suitable for use, unless exculpated. Even then, it must have been implied that extra compensation would be paid for correcting the deficiencies unless the language called for a specific assumption or risk by the contractor, i.e., where the effort was specified as contractual requirements with established provision for payment.²

2. The Misleading Impression of Inevitableness. It has been a problem for the Government to devise effective exculpatory language. The very consistency of the legal interpretations over the years served to strengthen the belief that a broad Government warranty of the TDP was both proper and nearly inevitable. In circular fashion, the strengthened belief generated more unrealistic offers and bids which resulted in more unrealistic contracts (buying in). It perpetuated an unrealistic state of affairs where many production contracts, of necessity, underwent frequent, questionably-founded and ill-structured adjustments to contract prices and schedules.

3. The Ease of Attaining Contract Adjustments. Conversely, to the preceding, it has been relatively "easy" for contractors to recover cost and time via the implied warranty method of recovery. At least it has been much easier than to satisfactorily demonstrate the existence of an impossible condition, a misrepresentation or a mutual mistake, which are other legal methods for recovery of cost and time.³ Although perhaps an oversimplification, contractor recovery of extra price and time has often been a simple matter of shuffling through the drawings to locate a defect or two with the knowledge that evidence of the mere existence of almost any defect would be negotiable, if any adverse consequences could be related thereto.

4. Difficulty of Attaining Contract Adjustment. Use of PPE concept has made it exceedingly difficult for contractors to recover additional cost and time for compatibility type changes. Perhaps this difficulty as contrasted to the previous ease of attaining contract adjustments has led to a number of protests and claims by prospective offerors and contractors. Eight Comptroller General decisions involving the PPE concept were identified with the 112 contracts reviewed during this study. In every case the Comptroller General upheld the Army's use of PPE and the legality of the concept. However, the possibility of additional protests and claims must be considered as potential problems that, hopefully, can be avoided by proper application of the concept.

C. MAJOR PROBLEMS.

1. PPE is Not Understood. The fundamental and major problem observed in the application and nonapplication of PPE was a general lack of awareness and understanding of the PPE concept. Time and time again the analysts attempted to intelligently discuss PPE.

with functional managers, supervisors, and cognizant lower level personnel responsible for the engineering and procurement of production quantities of Major Weapon System Items. It can be asserted that only a few personnel throughout AMC thoroughly understand the concept and even these few disagree as to how or even if it should be used in particular cases.

2. PPE Terminology and Guidance is Confusing. AMCP 715-6 describes the basic concept of PPE. However, it also describes variations and departures. The net results, from AMC point of view, is that in the last few years AMC has experienced a movement from the PPE conceptual phase, i.e., where multiple approaches are possible to achieve similar goals, to the operational phase of the evolutionary PPE life cycle without having developed and tested a single AMC operational baseline with latitude for departure.

3. Preproduction Evaluation Has Misleading Connotations. The name "Preproduction Evaluation" is at the source of major problems. The PPE name has at least three misleading connotations. The first connotation is that it is an evaluation process that is used to improve the quality of the TDP. The second connotation is that evaluation and application of the PPE concept continues only through the preproduction phase. And third, the acronym PPE is confused the Preproduction Engineering which carries a connotation of "engineering" to be done on something that needs it before starting production. All three of those connotations are in contradiction with the spirit and intent of the basic concept which envisions use of high quality TDP's to be evaluated throughout the entire period of contract performance. When this name confusion is added to the previously discussed PPE terminology and guidance confusion it is easily understood why the concept has eluded comprehension by almost everyone in the MSC's.

D. SOME MINOR PITFALLS.

A selected number of some of the more important minor pitfalls are categorized into (i) Pitfalls to avoid before PPE is used; (ii) pitfalls during Solicitation Phase; and (iii) pitfalls after Contract Award. First the pitfalls that should be avoided before the use of PPE will be discussed.

1. Pitfalls to Avoid Before PPE is Used.

a. PPE Should Not Be Used Indiscriminately. Policy on the application of PPE at the MSC's covered a wide spectrum and included no or limited usage at some MSC's to almost blanket application at Command F. However, before PPE is used it should be determined that certain basic prerequisites are present. The restrictive nature of such prerequisites, which are discussed in Chapter V, means that PPE should not be used indiscriminately.

b. Do Not Use With Low Quality TDP. The PPE concept is intended for use with high quality TDP that is essentially in compliance with Category E, MIL-D-1000. The PPE clause only provides for compatibility type changes for correction of errors, omissions, and deficiencies in TDP's. The Government must resist the temptation to use the PPE concept with low quality TDP and, thereby, shift an undeterminable cost risk to the contractor.

c. Do Not Use PPE With Simple Items When Only a Few Compatibility Changes Are Expected. A TDP for a relatively simple item would likely contain only a few errors, omissions, and deficiencies and would normally be deemed a very high quality TDP. However, due to the simplicity of the TDP, the purpose for using PPE, i.e., to prevent undue delays and excessive cost in the use of unproven TDP, would not be served by application of the PPE technique. For example, compatibility changes, if any, resulting from a TDP for a simple item would likely be few and, therefore, not become complex merely because of their quantity and interaction. Also such compatibility changes would likely be easily reviewed and quickly implemented under the provisions of the standard Changes clause. Because of the simplicity of such compatibility changes, they would be easily evaluated and negotiated by Government personnel. Consequently, such changes would provide limited opportunity for recovery of excessive cost and time under provisions of the Changes clause.

d. Do Not Use PPE With Cost-Reimbursement Contracts. The PPE concept shifts the cost risk for correction of errors, omissions, and deficiencies to the contractor. However, in a cost-reimbursement contract, the contractor is reimbursed for all allowable costs incurred during contract performance. Since PPE costs are necessary for contract performance and would likely be allowable costs, the use of cost-reimbursement contracts would prevent the shift of cost risk to the contractor and would make any PPE provision meaningless.

e. Do Not Use PPE Technique With IFB's (Other than Two-Step IFB's). Firmness of specifications is one of the basic prerequisites to consider before the use of formal advertising (IFB's). However, the inclusion of a PPE provision in a solicitation indicates that specifications are less than firm. If specifications are less than firm, then logically, the formal advertising method should not be used. Also formal advertising does not facilitate effective dialogue between industry and Government which is necessary to communicate the amount of risk to be transferred by use of the PPE technique.

2. Pitfalls During Solicitation Phase.

a. There is Ineffective Communication of the Amount of Risk Transferred. Ineffective communication almost always causes problems. This is especially true when PPE provisions are used. It is exceedingly difficult to communicate TDP quality information to prospective contractors so that intelligent decisions can be made concerning the magnitude of risk that must be assumed. The Government must assure that all known information concerning the quality of the TDP is made available to prospective contractors. If the degree of work and risk subsequent to award turns out to be substantially different from that which could reasonably have been communicated prior to contract award, it is likely to have either one or two undesirable results: (i) an equitable adjustment could be claimed and enforced, if necessary, through the ASBCA or the courts, notwithstanding the PPE provisions; or (ii) the contractor would have to suffer an unfair, perhaps catastrophic, loss because of the PPE provisions. For these reasons effective communication is necessary relative to the amount of risk to be assumed if PPE provisions are to effectively supplant equitable adjustments under the Changes clause.

b. Do Not Commingle Prices for PPE With Prices for Other Contract Items. When PPE prices are commingled with the related deliverable contract items, the amount of cost risk that the contractor estimates for PPE is difficult to determine. In fact, it may subsequently be alleged that no cost was estimated for PPE. To assure a meeting of the minds concerning the transfer of cost risk and the presence of consideration for making post award corrections of errors, omissions, and discrepancies in TDP's, PPE prices should not be commingled with or lost in the prices of other contract items.

3. Pitfalls After Contract Award.

a. Administrative Procedures of PPE Clauses Must Be Complied With. The PPE clauses used by MSC's provide only a short period, usually 15 to 30 days, for the Government to review and approve or disapprove CECP's. Since contractors cannot stop work awaiting the Government's action, most PPE clauses contain an assumption of CECP approval if the Government's disapproval has not been received at expiration of the review period. Also most PPE clauses provide for application of the Changes clause for any CECP disapprovals received after the review period. Therefore, before PPE is used it is incumbent on the Government to assure that timely review of CECP's will be accomplished. This may require delegation of approval authority for CECP's from a Configuration Control Board to designated engineering personnel. It should be emphasized that sufficient resources must be available and the Government must be responsive to CECP's. Otherwise the Changes clause will apply to CECP's and the purpose for using PPE will be thwarted.

b. A Comprehensive Evaluation of All Changes to the PPE Contract is Required. Normally, contract changes are subject to implementation under the provisions of the Changes clause or implementation under other contract provisions such as the Value Engineering Incentive clause. Since the Changes clause allows for price increases and delivery extensions, the contractor would have an incentive to interpret any changes that are not clearly CEC's in this category. Conversely, there would be an incentive to include as CEC's any doubtful changes which could properly be classified as Value Engineering Change Proposals. This points out the importance of having a PPE clause which clearly defines CEC's. However, it also exposes another pitfall and shows the importance of having a comprehensive Government evaluation of all changes submitted under a PPE contract.

c. Substantial Design Deficiencies Are Not Included. A critical pitfall involves the types of deficiencies that contractors will be responsible for correcting under PPE provisions. The PPE clauses currently in use have not resolved this pitfall. This assessment resulted from the following observations: (i) a prospective offeror declined to propose because it seemed to him that the Government wanted someone to "do the engineering." He stated that he would be pleased to perform production work but only after the engineering had been finished; (ii) numerous cases were observed wherein prospective contractors requested clarification about whether design as well as "technical data" errors and omissions were intended to become the responsibilities of the contractor; (iii) numerous contractors expressed confusion after award about whether the PPE provisions included design deficiencies; some were adamant that they did not enter the contracts with an intent to be responsible for design deficiencies.

Paraphrasing a basic premise of AMCP 715-6, the contractor, under PPE provisions is to be completely responsible for both producibility and performance in accordance with the contract specifications and any attempt to relieve the contractor of responsibility for design changes essential to equipment performance should be limited to systems which are primarily mechanical in nature.⁴ Such relief would be entirely impractical in contracts for electronic equipment since most incompatibilities in the technical data will normally involve circuit function rather than form and fit. On the other hand, AMCP 715-6 acknowledges a limitation on the degree of design responsibility to be transferred and states that any tendency to place a degree of design responsibility upon the PPE contractor which would be inconsistent with a firm fixed-price or fixed-price incentive contract and specified schedule requirements should be carefully avoided.⁵

Responses received during the interviews of this study affirmed, even where the equipment was primarily electrical in nature, that substantial development of the details of the product design was not intended. However, it was reported, (i) that some design effort may be inherent or at least incidental to the task of manufacturing the item(s); and (ii) that nearly any change to the TDP can be construed as a design change. In fact, several individuals interviewed elaborated on the difficulty of defining data deficiencies and design deficiencies. Indeed if a distinction can be drawn, it would normally require a face-to-face dialogue between two expert and unbiased engineers to equitably allocate the respective responsibilities.

The degree of responsibility to be transferred for development of the details of the product design was absent from the express language of many of the contracts observed. Therefore, in the absence of express language, it would seem that a reasonable implication would be that some responsibility for design deficiencies was intended to be transferred (except where excluded) but not a substantial amount; i.e., not an amount which would be inconsistent with the whole of the other contract provisions.

In summary offerors, contractors, and Government personnel are confused over the design responsibilities. Numerous confrontations have occurred over this matter, and more can be expected unless it is clarified. It is considered a mistake to distinguish between design and data deficiencies, even where the procurement items and systems are primarily mechanical. An express exclusion of design responsibility would increase the number of changes which would have to be equitably adjusted under the Changes clause. While this problem may not be critical to the success of a given procurement, it would reduce or even negate other important benefits of the PPE concept. That is, it would tend to build in to the contract the very adversities that the PPE concept attempts to defeat. It would encourage rather than discourage incapable or unmotivated offerors. It would increase rather than decrease the probability of "getting well" or "getting more" during contract performance. For these reasons the need to clarify the issue of design responsibility and the need to carefully control exclusions of design responsibility are considered to be pitfalls which may adversely affect both individual procurement actions and viable on-going relationships with industry. In particular instances, industry may be pleased wherever "design responsibility" (whatever that means) is excluded or even where the contractor is

relieved in part from such responsibilities. But in the larger sense, the problem is not to exclude fair allocation of responsibility but to more clearly define what is fair. At present, a fair allocation seems to involve some but not a substantial degree of design responsibility. A more definitive description of a fair allocation simply does not exist at the present time and it would vary case by case. A division of responsibility based upon the word "substantial" would be more meaningful and equitable than a division based on the differences between "data" and "design" deficiencies, especially since the word substantial could be defined for each procurement action in order to narrow the opportunity for disagreements.

CHAPTER V
GUIDELINES FOR BETTER APPLICATION OF PPE

A. GENERAL OBSERVATIONS ON USE AND CONTINUED USE OF PPE.

1. Preproduction evaluation as a new procurement concept has received both criticism and praise. Many Government personnel like the concept while others dislike it or treat it with indifference. It can be rationalized that any new procurement technique would meet some resistance, if only because of the natural human resistance to change. But the use of PPE procedures has resulted in marked resistance during recent years. In numerous observed instances protests were filed, letters of complaint were sent to contracting officers, and personal visits were made by corporate officials to headquarters elements. However, early in the development phase of the PPE concept undue importance should not be attributed to such resistance by industry. It is considered advisable to keep an open mind, if possible, about the merits of PPE and listen to any and all complaints of industry to better understand their specific objections. By so doing new ideas and better ways of improving the PPE concept may be learned for the mutual benefit of Government and industry.

2. After an exhaustive analysis of the PPE concept which culminated in this study, the analysts agree that PPE is fundamentally a sound and potentially a viable and effective concept. For example, Table V-1 indicated that an average of 100 compatibility changes are approved per contract throughout the MSC's of AMC. Since these are the same type of changes that are covered by PPE provisions, the potential benefits of PPE are great. Although the average of 100 approved CEC's for all contracts may be misleading when compared to PPE type contracts, it has been observed that numerous contracts with PPE have experienced hundreds and a few contracts have experienced over a thousand changes without requiring the negotiation of an equitable adjustment of prices and delivery. A few specific observations on PPE are as follows:

a. With approximately 3,900 drawings, excluding military standards, a Command B contract had 1,335 approved changes out of 1,727 CECP submissions. (As an aid to visualization of the magnitude of the activity, it occupied 12 file drawers of changes and each change affected an average of three drawings.)

b. In a Command C contract over 2,000 changes were processed. This was also an awesome situation, especially as viewed by the personnel intimately involved with processing the changes.

c. Command E's family of items, a member of the ACO's team attested that approximately 1,800 changes had been processed. (This data was received informally with a lapse of time after the field survey.)

d. Regarding one of Command C's contracts, the Government engineer asserted, "there is no question about the value of PPE on this contract. Over 500 changes were processed in the form of 60-70 CEC's prior to the first article approval."

TABLE V-1. APPROXIMATE NUMBER OF APPROVED CEC's OBSERVED

Major Subordinate Command	Total of All Contracts	Average Per Contract	High Frequency Observed
Command A	2,765	312	1,443
Command B	2,843	258	1,335
Command C	2,622	437	2,000
Command D	450	112	427
Command E	60	30	60
Command F	1,503	20	134
TOTAL AMC	10,243 (10,000)*	91 (100)*	2,000

*If the recently issued contracts were to be excluded from the computation, the averages AMC-wide would be approximately 10,000 CEC's divided by 100 contracts for a contract average of 100 CEC's.

e. In Command F's contracts to cite only two examples among about 70 contracts, 115 CEC's were approved in one contract and 150 CEC's were observed in another.

3. In summary the attitudes of most AMC participants in this study, both as individuals and as organizations, are generally favorable to the concept of PPE. In addition the analysts subjective assessment of observed PPE contracts and their assessment of the potential benefits of PPE points toward continuation of the concept, but only with a refined and more selective application.

B. BASIC PREREQUISITES FOR USE OF PPE.

To provide a foundation for understanding the specific guidelines recommended by this chapter, the basic prerequisites for use of PPE, which parallel the criteria contained in AMC 715-6, are stated below:

1. A detail design Technical Data Package must be available in full conformance with Category E, Specification MIL-D-1000. By definition, Category E (Procurement of Identical Items) also includes Category F drawings (Procurement of Interchangeable Items) which would include Source Control and Specification Control drawings, as appropriate.

2. The item to be procured should be a major item or system of at least moderate complexity. The simpler items on which relatively few engineering changes may be expected would not normally require or justify the more sophisticated PPE contracting approach.

3. The end item detail specification must be complete and accurate with respect to all essential functional requirements.¹

C. SPECIFIC GUIDELINES FOR BETTER APPLICATION OF PPE.

1. **Guideline 1—A Thorough Government Review of TDP Quality Must Be Completed Before the Procurement Solicitation Phase.** Measurement of the quality of a TDP to assess how effectively it can fulfill its intended use has been a major problem throughout AMC. Unlike hardware, a TDP cannot be adequately tested and inspected until someone other than the developer of the TDP has actually used it successfully. In-depth Government and third party reviews have limitations and it is not economically feasible to eliminate every error by any known method. Studies and probes into this general problem area have been conducted and a technique that provides a limited measure of TDP quality has been developed.² Notwithstanding the existence of such a technique, the Government must conduct an intensive review to determine TDP quality. At the very least the general parameters of the TDP should be identifiable from its use in previous procurements, past configuration audit data, inspection/acceptance records, in-house or third party review findings, and the general knowledge of the offices with mission responsibility. Such information must be communicated to prospective contractors during the procurement solicitation phase to permit a predetermination of prices for the risk to be assumed. In summary it should be emphasized that adequate review of TDP quality is most important and it should be given top priority. Not only does adequate review provide the Government with information to determine whether or not PPE should be used, but, if used, it provides information that is necessary for determination of a fair and reasonable price for PPE.

2. Guideline 2—Use PPE on Complex Procurements Where Numerous CEC's Are Anticipated. The complexity of the procurements which employed PPE was considered during this study. The PPE concept fundamentally addresses complex rather than simple items, but the definition of complexity was found to be somewhat vague. Almost any item of Military Design Equipment takes on complex characteristics, at least when compared with "off-the-shelf" items. The degrees of novelty, uniqueness, and state of the art affect relative complexity and are reasons for anticipating numerous CEC's. But the only measurable observations available during the study was the approximate number of drawings of some of the items together with a few of the unit prices. This data is depicted in Tables V-2 and V-3. From Table V-2 it is evident that many of the TDP's had thousands of drawings and related documents. On the other hand, Command F used PPE with at least one TDP of only 40 drawings and a unit price of \$3.15. Whether the PPE concept has been used on items of lesser complexity is perhaps debatable, but it is not recommended by this study. The point is that the concept has been used on items which are characterized as both very high and quite low in complexity. Also the relationship of the number of product drawings to the anticipated number of CEC's has been estimated at approximately one to four; that is, for every four drawings a CEC could be expected.³ Identification of the ratio of CEC's to drawings was an effort beyond the scope of this study. But observations indicated that the ratio may vary widely, i.e., from 1:3, 1:4, 1:50, but averages 1:6. This points out that the number of anticipated CEC's for a given TDP is (i) difficult to estimate; and (ii) that it would depend on several variables such as the degree of review and inspection of the TDP, the number of times it has been previously produced, the number of drawings, and other TDP documents, the nature of the commodity, unit price, and so forth. More importantly, it would also depend on the particular contractor selected to perform the ensuing production. In summary, it should be stated that it is impossible to precisely establish the degree of complexity or an anticipated number of CEC's that would justify the use of PPE. The only guidance is that PPE should be used on a case-by-case basis and then only with relatively complex procurements where a large number of CEC's are expected.

TABLE V-2: APPROXIMATE NUMBER OF PRODUCT DRAWINGS AND THE UNIT PRICES IN SOME OF THE OBSERVED CONTRACTS

Major Subordinate Command	APPROXIMATE NUMBER OF PRODUCT DRAWINGS		UNIT PRICE (\$)	
	High	Low	High	Low
Command A	3,000	144	61,785	4.58
Command B	3,900	N/A	66,122	2,571.00
Command C	3,000	500	106,667	1,600.00
Command D	—*	—*	9,921	508.00
Command E	—*	—*	105,300	—*
Command F	7,000	40	8,735	3.148
AMC-WIDE	7,000	40	106,667	3.148

*Data not observed

TABLE V-3: A COMPARISON OF THE APPROXIMATE NUMBER OF PRODUCT DRAWINGS WITH THE APPROXIMATE NUMBER OF CEC'S PROCESSED

No. of Contracts Observed	Major Subordinate Command	No. of CEC's	No. of Product Drawings	Average No. of CEC's Per Drawing
12	Command A	2,692	11,055	.24
1	Command B	1,300	3,900	.33
2	Command C	131	3,500	.04
—	Command D	—	—	—
—	Command E	—	—	—
8	Command F	190	8,785	.02
23	AMC-WIDE	4,313	27,240	.16

3. Guideline 3—Use PPE on Initial Production Contracts and Subsequent Procurements. AMCP 715-6 envisioned that PPE would be used primarily with initial production contracts. However, the extensive employment of PPE in subsequent procurements was surprising to the analysts. An analysis of the various contracts confirmed that the PPE technique has much wider applicability. Several MSC's used it on procurements which had experienced major revisions to the TDP and numerous repeat buys were observed. To test the complexity (Guideline 2), the approximate number of CEC's occurring on repeat buys was compared with initial production contracts in Table V-4. About one third as many CEC's occurred in repeat buys as in initial production contracts, but the average of 66 still represents what is considered a numerous quantity. Certainly, it is enough to cause the incidence of delays and price increases when each of the 66 is subject to negotiation. Furthermore, several of the personnel interviewed stressed that instead the incidence of CEC's tends to be reduced in stair-step fashion. In many cases the continuous incidence of numerous changes surprised personnel. At Command F, the relatively rapid technological turnover was cited as the reason for the reoccurrence of CEC's. But at Command B, a similar pattern of many CEC's was observed during subsequent procurements. One assessment that can be made in view of the number of CEC's which have occurred in subsequent procurements, is that development of an error-free TDP may be more of an ideal state than a realistic expectation. Another assessment is that the PPE technique has applicability in subsequent procurements as well as initial production contracts if numerous CEC's are expected.

TABLE V-4: APPROXIMATE NUMBER OF CEC'S OBSERVED ON REPEAT BUYS IN COMPARISON WITH INITIAL PRODUCTION CONTRACTS*

Major Subordinate Command	INITIAL PRODUCTION			REPEAT BUYS		
	Total	Average	Number of Contracts	Total	Average	Number of Contracts
Command A	786	87	9	1,979	396	5
Command B	2,553	510	5	290	48	6
Command C	2,421	405	5	201	201	1
Command D	431	215	2	19	10	2
Command E	N/A	N/A	N/A	60**	30**	2
Command F	224	19	12	766	22	34
TOTAL AMC	6,415	194	33	3,315	66	50

*Computed from observations where a distinction was known between initial production and repeat buys.

**Information received subsequent to survey indicated that approximately 1,500 changes were incorporated in a major contract; this would markedly increase the observed data depicted above.

4. Guideline 4—Use PPE With “Full Quantity” Production Contracts. In all procurements observed, the respective quantities under contract would be characterized as “full” rather than “limited” except for four of the procurement actions at Command A. These Command A procurements were for lesser quantities than were to be subsequently procured by another activity. That is, a contract for 300,000 items at Command A was intended to achieve production refinement of the TDP for subsequent procurement of 3,000,000 identical items by another activity. For use of PPE with less than a full quantity, the reader should be familiar with the technique called “proof lot”⁴ as explained in AMCP 715-6. While the use of PPE provisions at Command A seemed generally effective, the reasons why PPE provisions were not also employed in the follow-on contracts by the other procuring activity could not be clearly determined. It would seem that the full range of benefits from use of the PPE technique was forfeited either for the need for extremely tight configuration control of the TDP during the larger quantity procurements or for reasons attributable to lack of awareness of the potential benefits of PPE.

5. Guideline 5—Use PPE Throughout the Span of Contract Performance. One MSC departed from the term preproduction evaluation very early. They choose to call the technique Production Evaluation (PE) because the evaluation of the TDP and the assumption of risks continue, in their conception, to the end of the contract. This conception agrees with that prescribed by AMCP 715-6, except that the names differ. The difference in names may not be critical because "a rose by any other name is still a rose." But it was evident from the interviews conducted, that this Command strongly resisted the implications of the term PPE. Also evident from the reviews was the fact that many contractors would have preferred to have their risks cease with respect to compatibility deficiencies as actual production commenced. It was not easy for personnel of this Command to hold their contractors to their responsibilities throughout the span of performance; it was necessary to clarify that aspect of the concept again and again.

Command D also employed PPE provisions throughout the span of the contract, but their recent procurement instruction relative to the PPE technique in future procurements called for cessation of PPE provisions after completion of first article. Command C negotiated the PPE provisions out of one of their major contracts after completion of first article. The precise reasons for this action were not clear. Even though it was proper to freeze the baseline, the resultant effect on the success of the contract is questioned. Especially if the contractor submits numerous CECP's which have to be negotiated under the Changes clause. In many other contracts the frequency and severity of changes continued relatively high after first article, e.g., out of a total of 150 CECP's in one contract, 50 were submitted subsequent to first article, 30 of which were alleged to be of the cost-increasing type. Several engineers interviewed throughout the commands attested to a rough rule of thumb estimate of 20 percent prior to, 50 percent during, and 30 percent after the first article or preproduction model phase.

Command A's employment of PPE provisions suggested a heavy emphasis on the evaluation function, even though they did require continuous contractor assumption of risk to the end of the contract. Commands B and E, also consistently employed the full effect of the PPE provisions throughout the full span of contract performance.

In further discussion of the confusion caused by the name PPE, it should be noted that several nonusers of PPE provisions interviewed during this study stated that they routinely do the same things as are accomplished under PPE except that the functions are labeled with different names. Upon closer investigation, it quickly became apparent that efforts similar to PPE to which they referred did not include predetermination of prices and the shift of responsibility and risks associated with CD's.

The selected name of the concept, Preproduction Evaluation, denotes a specific technique with several functional elements, but it carries a strong connotation that the main step is an evaluation that will be completed prior to production. Perhaps evaluation is the most important step. But the primary objective of PPE is to shift the responsibility of correction of errors, omissions, and discrepancies in TDP's from the Government to the contractor, a function which is not implied by name. It is likely that this connotation has influenced the manner by which the PPE technique has been employed at some organizations, as indicated above. Perhaps a more descriptive name for the PPE concept, e.g., "Compatibility Engineering Change Responsibility" (CECR) should be used to indicate the concept is ideally employed throughout contract performance and involves a shift of responsibility to the contractor.

6. Guideline 6—Use With Both Competitive and Noncompetitive Procurements.
PPE may be used with competitive and noncompetitive procurements.

a. **Competitive Procurements.** The PPE concept is an attempt to improve the Government's ability to successfully introduce competition in complex procurements of military design equipment. Therefore, the primary application would be expected in the competitive environment and this was the observation, as evident from Table V-5. Of the 83 contracts reviewed, 74 (89 percent) were competitively solicited and awarded. Based on evidence in 32 of these contracts, eight firms both large and small businesses, expressed an interest in participating in the procurements notwithstanding the PPE provisions.

TABLE V-5: CONTRACTS WITH PPE PROVISIONS AWARDED COMPETITIVELY AND NONCOMPETITIVELY

Major Subordinate Command	Competitively Awarded Contracts			Number of Noncompetitive Contracts	Number of Contracts Where Data Was Not Observed
	Number of Contracts	Approximate Number of Bidders/Offerors	Average Number of Offerors/Bidders Per Contract		
Command A	12	111	17	2	-
Command B	6	19	5	4	1
Command C	3	8	8	-	3
Command D	4	33	8	-	-
Command E	1	3	3	-	1
Command F	48	78	8	3	24
AMC-WIDE	74	252	8	9	29

b. Noncompetitive Procurements. Appendix K of AMCP 715-6 sets forth a sample "Certification of Technical Data" clause which establishes special PPE provisions for noncompetitive contracts. In one way or another this clause was tailored to fit nine of the 83 contracts observed or about 11 percent. The analysts feel that a tailored version of the clause is applicable to substantially more noncompetitive procurements. However, several of the personnel interviewed seemed to be unaware of the purpose and procedures and in some cases the existence of the noncompetitive version of the PPE clause.

7. Guideline 7—Use PPE with RFP's, RFQ's, and Two-Step IFB's. PPE provisions must be employed in solicitations which permit effective pre-award communication with all prospective contractors concerning TDP quality. Three solicitation methods, request for proposals, request for quotations, and two-step formal advertising, permit and encourage communication between Government and industry. The use of these solicitation methods is considered appropriate since the PPE concept requires a firm understanding of its special provisions, responsibilities, and limitations.

8. Guideline 8—Use PPE with Firm Fixed-Price (FFP) and Fixed-Price Incentive (FPI) Contracts. By definition PPE is a shift of the cost risk associated with compatibility changes from the Government to the contractor. Also by definition a FFP contract in relation to a cost-reimbursement contract is a shift of the cost risk of performance from the Government to the contractor. Since PPE is only one of a contractor's many cost considerations, it is felt that PPE is best utilized under an FFP contract. However, an FPI contract is a variation of an FFP contract and transfers only slightly less risk to the contractor. Therefore, an FPI contract is also considered appropriate for application of the PPE concept. To use any other type contract with PPE is a contradiction. For example, use of a cost-reimbursement type contract with PPE would be meaningless since the Government would ultimately reimburse the contractor for all allowable costs, including PPE costs, that are incurred during contract performance.

9. Guideline 9—Provide Separate Line Item Prices for PPE. Failure to include PPE as a separate contract line item number (CLIN) in the solicitation even though it is not easy to estimate what the PPE effort costs, could mislead a contractor and imply that the Government does not foresee the PPE effort as a major part of the production contract. If both the Government and the contractor are unable to define the PPE requirement, it must be ambiguous and a possible mutual mistake could be made thus potentially allowing the contractor to appeal for an equitable adjustment at a later date. Any such claim would probably be upheld by the courts. Therefore, it is considered desirable and preferable to be able to identify PPE prices. This can be accomplished by requiring that a price be included

for the PPE CLIN. It would also be permissible not to separately price (NSP) the PPE CLIN provided that PPE prices can be easily identified. This can be accomplished by including NSP in the amount column and including the PPE price in parentheses within the item description block of the PPE CLIN. Primary among the several discrete benefits which accrue from separately identifiable PPE prices is an increased ability to detect and rectify gross misunderstandings before and during negotiations and before a contract is awarded.

10. Guideline 10—Use Appropriate Pre-Award Communication Techniques to Insure a Mutual Understanding of PPE. When the PPE technique is to be used with its significant transfer of responsibilities to a contractor, it is incumbent on the Government to acknowledge its superior knowledge about the relative status of the TDP so that a clear understanding will form the basis of a mutually satisfactory, as intended contractual relationship. Some facets of the status of the TDP may not be known by the Government, but that which is known, or should be known, should be transmitted. It follows that the level of the necessary communication varies, i.e., in one case the degree of information exchanged during the solicitation phase may be relatively low; in another case an extensive exchange of information may be vital. Unless the Government states otherwise, a prospective contractor would likely infer that the TDP "quality index factor" would be high and that substantial development work would not be intended, notwithstanding an acknowledgment of the potential existence of CD's, whenever a competitive solicitation is issued for a fixed-price type supply contract. When that situation is not the intended contractual relationship, it is incumbent upon the Government to communicate as effectively as possible in whatever ways it can to provide offerors the opportunity to assess the risks and to minimize erroneous assumptions about the relative soundness of the Government-furnished TDP. Methods of improving pre-award communications include presolicitation conferences, technical proposals, allowance for extra "on the street" lead time, negotiation conferences, pre-award surveys and letter/certificate of understanding. Most of these communication methods are appropriate even without PPE, but certain of these methods may be required when transferring responsibility by the PPE technique because of the unavailability of an equitable adjustment subsequent to award. Furthermore, it would seem to be especially important to be as informative as possible in view of the inherent difficulties of attaining accurate quality measurement of the TDP and mutual understanding of the intended contractual relationship.

D. GENERAL GUIDELINE FOR BETTER APPLICATION OF PPE.

Selective Application of PPE is Appropriate. The work and risks within the PPE concept are not neatly severable from that which would be expected to almost any "normal" supply contract. To illustrate this point, factors in Table V-6 can be seen to affect both contracts with and without PPE provisions. In view of the commonalities of work/risk

relationships, some personnel interviewed at several different commands, felt that the PPE technique should be included in all contracts except where it would be justified to exclude it. They feel that the effort is normal to review the TDP, correct it as necessary, and proceed in accordance with the correct version. This viewpoint emphasizes the act of correcting the TDP and deemphasizes the assignment of responsibility for the consequences of the CCD's. Other individuals perceive the application of PPE provisions to be extraordinary. During the study of the PPE concept, the theme prevailed that the efforts of coping with TDP defects has consistently been interpreted by the courts and boards to be extraordinary and, therefore, worth of added price and time. Also, since the courts have consistently granted equitable adjustments without PPE, the act of assigning responsibility differently should be taken selectively rather than automatically. The question posed is perhaps whether use of PPE is normal in the world that ought to be or the world that is in actuality. Certainly, the adoption of one view or the other has affected PPE applications. That is, if the PPE effort and risk are perceived as normal without added cost and benefit, it follows that standard application would avoid the undesirable consequences of its absence when needed and where not needed the provisions would be free. However, if the effort and risk are viewed as extraordinary, with both costs and benefits flowing from its use, it follows that application would be recommended only in cases which promised a net benefit. The latter selective application of PPE is recommended by this study and this is the approach that has been practiced by Commands A, B, C, D, and E. However, standard application of the PPE techniques as utilized by Command F, is not recommended and a standard operating procedure approach should be avoided.

TABLE V-6: WORK/RISK RELATIONSHIPS BETWEEN CONTRACTS WITH AND WITHOUT PPE PROVISIONS

Work/Risk Category	Extent of Contractor Effort/Risk	
	Without PPE	With PPE
Review of TDP for CD's	Some	More
Technical Analyses	Some	More
Worst Case Analyses	Some	More
Trial and Error Fabrication of Hardware	Some	More
Submission of CECP's	Some	More
Implementation of CECP's Without Contract Adjustment	Some	More
Contingencies	Some	More
Applicable Profit	Some	More

CHAPTER VI
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. SUMMARY.

Chapters I, II, and III evaluated the theory of Preproduction Evaluation as defined by AMCP 715-6 and looked at the PPE concept from both a conceptual viewpoint and as practiced by the major subordinate commands of AMC. The reasons for using PPE, i.e., to prevent undue delays and excessive cost in the use of an unproven TDP, and the reasons for TDP deficiencies were analyzed in Chapter II. During this study, 112 contracts at MSC's, representing the total population of contracts with PPE provisions that were in existence within AMC, were reviewed. Additional data and observations were derived from letters of inquiry, interviews, and a review of relevant literature. In Chapter III a review of the 112 contracts at MSC's provided considerable data on the types of solicitations, and types of contracts that employed the PPE technique. Observations were also provided on communicative techniques, e.g., solicitation of technical proposals, presolicitation conferences, post-award conferences, extra solicitation lead time, pre-award surveys, and letter/certificates of understanding. Also data and observations were obtained on the dollar value of contracts and the usage of PPE at the respective MSC's. The potential as well as the problems and pitfalls of PPE were identified and categorized. Under problems and pitfalls, Chapter IV explored the legal and contractual problems that must be overcome before successful application of PPE. Also major problems and, in many cases, the resulting minor pitfalls were discussed. In summary, Chapters IV and V contained guidance which should be helpful in avoiding problems and pitfalls and in applying PPE in a more consistent manner.

B. CONCLUSIONS.

This study resulted in the conclusion that PPE is not generally understood by personnel of the MSC's. It was revealed that there is considerable disagreement as to how PPE should be used and even whether it should be used in particular cases. It was concluded that there is a lack of AMC guidance on the proper usage of PPE. As a result of this void, local PPE instructions have evolved with their varying interpretations and terminology which is confusing to both industry and Government. Finally, it was concluded that it is desirable to continue utilizing the PPE procedure. The basic reasons for using it still remain. In spite of many problems, and notwithstanding that one MSC applies and administers the technique in questionable ways, the procedure has been employed with at least limited effectiveness. It is felt that most, if not all, of the problems and pitfalls can be overcome or at least reduced to manageable proportions by concerned management analysis and

guidance. Past experience has amply demonstrated that in TDP's of even the highest quality, a competitively selected production contractor will identify numerous changes that are required to correct errors, omissions, and discrepancies and to meet the objectives of the procurement action. At the present time, the PPE technique of correcting TDP deficiencies without additional cost or delivery delay is one of a very few, if not only, pre-award solution to this real-life problem. Accordingly, the PPE concept should be refined and improved rather than abandoned.

C. RECOMMENDATIONS.

To provide a better understanding and, consequently, more consistent application of the PPE concept, it is recommended that AMC issue an AMCPI on PPE and revise AMCP 715-6. It is also suggested that a more descriptive name for the PPE concept, e.g., "Compatibility Engineering Change Responsibility" (CECR) be used. It is deemed advisable to rename the concept since the name "Preproduction Evaluation" presently has different meanings throughout AMC. It would be difficult enough to implement consistent usage of the PPE concept without being hampered by the diverse terminology and misconceptions currently associated with the concept.

To provide the basis for more consistent application of the PPE concept, major problems and minor pitfalls as well as 10 specific guidelines for better application of PPE were postulated by Chapters IV and V, respectively. Minor pitfalls are especially important since in many cases they are in the form of recommendations on when not to use PPE. These minor pitfalls were separated by Chapter IV into three categories and subcategories as follows:

1. Pitfalls to Avoid Before PPE Is Used.
 - a. PPE should not be used indiscriminately.
 - b. Do not use PPE with a low quality TDP.
 - c. Do not use PPE with simple items when only a few changes are expected.
 - d. Do not use PPE with cost-reimbursement contracts.
 - e. Do not use the PPE technique with IFB's (other than two-step IFB's).
2. Pitfalls During Solicitation Phase.

- a. There is ineffective communication of the amount of risk transferred.
 - b. Do not commingle prices for PPE with prices for other contract items.
3. Pitfalls After Contract Award.
- a. Administrative procedures of PPE clause must be complied with.
 - b. A comprehensive evaluation of all changes to the PPE contract is required.
 - c. Substantial design deficiencies are not included.

As a result of the above observed pitfalls, 10 specific guidelines for improved application of the PPE concept were recommended and discussed in Chapter V. As would be expected, many of these guidelines are the converse of the pitfalls listed above. The 10 specific guidelines recommended for better application of PPE are summarized as follows:

Guideline 1—A thorough Government review of TDP quality must be completed before the procurement solicitation phase.

Guideline 2—Use PPE on complex procurements where numerous CECP's are anticipated.

Guideline 3—Use PPE on initial production contracts and subsequent procurements.

Guideline 4—Use PPE with "full quantity" production contracts.

Guideline 5—Use PPE throughout the span of contract performance.

Guideline 6—Use PPE with both competitive and noncompetitive procurements.

Guideline 7—Use PPE with RFP's, RFQ's, and two-step IFB's.

Guideline 8—Use PPE with FFP and FPI contracts.

Guideline 9—Provide for separate line item prices for PPE.

Guideline 10—Use appropriate pre-award communication techniques to insure a mutual understanding of PPE.

In addition to the above guidelines a proposed definition of compatibility type deficiencies and key terms associated with PPE are included in Appendix A to this study. However, these key definitions are only the beginning. Before any improvement in the PPE technique can be effected, the following steps must be taken:

Step 1. Draft a proposed standard PPE clause that may be tailored for individual procurements and which includes common terminology and definitions.

Step 2. Revise the proposed standard PPE clause after formal coordination with the MSC's of AMC.

Step 3. Review and approve the proposed standard PPE clause by AMC.

Step 4. Implement the standard PPE clause and improve understanding of the concept by revision of AMCP 715-6 and concurrent issuance of an AMCPI on the standard PPE concept.

Step 5. Provide on-site training classes/seminars on the standard PPE concept as contained in the revised AMCP 715-6 and AMCPI.

The Procurement Research Office is presently drafting a proposed standard type PPE clause (step 1 above) as part of this study effort. This clause will be forwarded to AMC at which point it is recommended that the advisability of implementing steps 2-5 be considered for implementation.

In summary, it is emphasized that continued use of PPE by MSC's of AMC is recommended. It is believed that the guidelines and findings of the study will enable the MSC's to better utilize the PPE technique and take local actions that are directed toward a standardization of the PPE concept notwithstanding implementation of steps 1 through 5 above. Finally, it should be emphasized that the PPE concept is to be used selectively and not indiscriminately.

NOTES

CHAPTER 1

¹Armed Services Procurement Regulation Committee Cases 70-92 and 70-103, 13 April 1973.

CHAPTER 3

¹Armed Services Board of Contract Appeals Case 16067, Emerson-Sack-Warner Corporation.

²"An Analysis of . . . Command Procurement Problems," U.S. Army Procurement Research Office, 13 April 1973. (Internal report not distributed.)

³"Procurement Preproduction Evaluation (PPE) Contracts," AMC Pamphlet 715-6, May 1970, p. 0-1.

⁴"The Government Contractor," Vol. 13, No. 15, par 297, 26 July 1971, pp. 296-7.

⁵Comptroller General Decision B-165953, Risk of Defects in Government Specifications, 23 May 1969.

CHAPTER 4

¹Dygert, George H., "Implied Warranties in Government Contracts," Military Law Review, Vol. 53 (Summer 1971), p. 69.

²Armed Services Board of Contract Appeals Case 13341, Bethlehem Steel.

³Dygert, op. cit., p. 64.

⁴"Procurement Preproduction Evaluation (PPE) Contracts," AMC Pamphlet 715-6, May 1970, p. B-9.

⁵Ibid., p. iv.

CHAPTER 5

¹"Procurement Preproduction Evaluation (PPE) Contracts," AMC Pamphlet 715-6, May 1970, p. B-11.

²U.S. Army Materiel Command, Impact Program Report—Technical Data Package Improvement, Report No. 1 (Washington, D.C.: U.S. Army Materiel Command), pp. 61–74.

³"Procurement Preproduction Evaluation (PPE) Contracts," op. cit., p. A-5.

⁴Ibid., p. B-14.

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APPENDIX A DEFINITION OF TERMS

1. **Technical Data.** Technical data are recorded information used to define a design and to produce, support, maintain, or operate items of defense materiel. These data may be recorded as graphic or pictorial delineations in media such as drawings or photograph; text in specifications or related performance or design type documents; in machine forms such as punched cards, magnetic tape, computer memory printouts; or may be retained in computer memory. Examples of recorded information include engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. For purposes of this study, research and engineering data are included but financial and administrative data are excluded.

2. **Technical Data Package (TDP).** A collection of technical data products (items) which is complete for a specific use. As used in this study the term also generally refers to the category of intended use where the item, with modifications, is one planned for multi-year usage and will involve several supply production contracts. Generally, full design disclosure data and procurement data are required.

3. **Procurement Data Package.** A collection of all data necessary for procurement of the items which it pertains, e.g., engineering drawings, specifications, manufacturing information essential to production, and test procedures. [It is not intended that unnecessary manufacturing data such as flow charts, process sheets, tool designs, etc., be furnished to support competitive procurement. However, there are many cases where it may be necessary or desirable to make unlimited rights therein.]

4. **Manufacturing Support Data.** Generally comprises (i) operation sheets and machine instruction sheets; (ii) machine-loading data; (iii) treatment data; (iv) tools, jigs, and fixture data; (v) product, process, or assembly data; and (vi) plant layout, machine tools, and work station data.

5. **Full Design Disclosure Data.** Full design disclosure data is information complete to the extent necessary to support a procurement or permit manufacture without additional design effort, and without recourse to the original design activity.

6. **Source Control Drawing.** A source control drawing is one which defines the required item entirely, or in part, by means of a vendor's part number. It may include additional functional test or configuration specifications, but since these are in themselves

inadequate to assure proper performance, installation, and interchangeability of the item in a specific application, procurement of the item is thus effectively restricted to the approved source or sources listed on the drawing.

7. Specification Control Drawing and Performance Specification. A specification control drawing which delineates requirements for an item in terms of functional and test specifications and external configuration data, with a little or no delineation of internal design or constructional features. It will cite one or more suggested vendor part numbers. A performance specification is defined similarly, except that it is prepared in the form of a Military Design Specification in accordance with DOD 4120.3-M (Defense Standardization Manual). A performance specification is used in preference to a specification control drawing for items to be repetitively and separately procured; when inspection and test requirements are lengthy and complex; or when the establishment of a Qualified Products List (QPL) is planned. Vendor part numbers are included in military specifications only in the form of a QPL.

8. "Contractor Responsible" Deficiencies and Key PPF Terms. An improvement is needed in defining those TDP deficiencies for which contractor responsibility is intended. AMCP 715-6 states: (i) the importance of a carefully drawn definition for both "compatibility" and Government-directed charges cannot be overemphasized; and, (ii) "Simplicity of definition should be strived for." However, this goal has not been achieved and a consistent set of key terms needs to be formulated and adopted throughout AMC which (i) uniquely apply to use of the PPE technique; and (ii) conform primarily to the name and definition of the type of TDP deficiency for which contractor responsibility is intended, with latitude for contraction or expansion of the parts of the definition of that particular deficiency as may be necessary to meet the needs of a given subordinate command or an individual procurement action.

The word "compatibility," as a name for the subject deficiency, has been almost universally adopted throughout AMC as the most descriptive. In view of the prevailing usage of the word "compatibility" it seems appropriate to describe the subject deficiency as a "Compatibility Deficiency" (CD).

A viable definition of a CD seems to also be available from a careful ordering of the definitional elements which have already evolved. Under the PPF provisions observed throughout AMC as an entity, to be transferred (i.e., a CD) generally had the following characteristics:

a. It would have been incompatible with the basic contractual objectives to deliver quality supplies in a timely manner in accordance with the TDP as furnished or as supplemented by authorized changes.

b. It would have conformed to the meaning of a Code A or C "compatibility" change as defined by MIL-STD-480, with only minor departure.

c. It would have occurred at any time throughout the contract performance period.

d. It would have been an error, omission, discrepancy, outdated aspect or inadequacy with respect to process data for which a change to the TDP had been mutually deemed essential or mutually desirable if deemed nonessential.

e. It would have precluded performance and manufacture on the one hand or just manufacture on the other, depending upon whether the relevant equipment was primarily electrical or mechanical and whether the contractor was the developer/previous producer or a competitively selected source.

f. It may have also precluded other important objectives such as attainment of compatibility between the various parts of the TDP, or physically and functionally suitable purchased parts and materials.

g. It may or may not have been a change to correct a previous change; depending on whether the specific contract provisions encompassed this situation.

h. It would not have represented a significant improvement or enhancement to the product.

i. It would not have been a Government-directed change.

j. It would not have been a Value Engineering or Cost Reduction change.

k. It would not have been a change which would have caused a reversal of the intended order or precedence of the documents within the TDP, i.e.,: Where "design" responsibility to completely achieve specified levels of performance was intended to be excluded, it would not have been a "design" change; otherwise, it may have been a "design" change.

l. It would not have been a deficiency which would have required substantial development of the details of the product design although it may have involved some development of or revisions to details of the product design.

m. It would not have been a deficiency which would have rendered the contract impossible or commercially impracticable to perform.

Each of the characteristics of a CD listed above can be and has been more elaborately described or defined with greater technical precision in both AMCP 715-6 and the contracts issued with PPE provisions. Therefore, it is concluded that one relatively common name and one relatively common set of definitions should be developed. As a "strawman" in this behalf, Table A-1 lists some definitions of several key terms which were conceptualized during the course of this study and which, hopefully, will result in better understanding and improved usage of the PPE concept.

TABLE A-1: DEFINITIONS OF SPECIAL TERMINOLOGY AND ACRONYMS

Number	Key Term, Acronym and Definition
1.	<p>Compatibility Engineering Change Responsibility (CECR). The responsibility to perform the work and assume the consequential risks associated with identification and correction of Compatibility Deficiencies (CD's), submission of CECP's that will resolve the incompatible conditions and implementation of the approved CECP's without compensation or extensions of delivery time other than that established at contract inception. (The Government assumes responsibility for rejected CECP's to the extent of the impact of the rejection.)</p>
2.	<p>Basic Contractual Obligation (BCO). The contractor's obligation would be specifically defined by a total set of contract provisions; but it can be generally defined as the responsibility to produce and deliver, in a timely manner, supplies conforming to the quality, configuration and performance requirements depicted within the TDP, either as furnished or as supplemented by approved changes during performance of the contract. This would include attainment of:</p> <ul style="list-style-type: none"> a. Function and performance requirements. b. Manufacturing and assembly requirements. c. Physically and functionally suitable purchased parts and materials. d. Compatibility between specified quality assurance provisions and the mandatory physical and functional requirements of the specifications and drawings. e. Compatibility between engineering parts lists and other technical data. f. Correction of mutually recognized errors in specifications cited, where such correction will provide greater compatibility with the existing detailed design.

Table A-1: Continued

Number	Key Term, Acronym and Definition
3.	<p>Compatibility. Capable of existing together in harmony; such as to agree; consistent, congruous. (The term "compatibility" in its broadest sense, most effectively describes the type of engineering changes of particular concern within the PPE concept and is a state or condition within which the multifaceted aspects of a given TDP are compatible with the BCO.)</p>
4.	<p>Compatibility Engineering Change (CEC). An engineering change issued to correct or otherwise reconcile the problems posed by one or more CD's. (Encompasses both Compatibility Engineering Change Proposals (CECP's) and approved CECP's.)</p>
5.	<p>Compatibility Engineering Change Proposal (CECP). An ECP issued by the contractor to identify the CD, explain the need for a CEC, and propose technical resolution to the incompatible condition.</p>
6.	<p>Compatibility Deficiency (CD). A TDP defect which the parties mutually agree necessitates a CECP at any time during performance of the contract because it gives rise to a condition which is incompatible with the BCO, except, for ECP's that are predominantly characterized for classification in one of the excepted categories listed below:</p> <ul style="list-style-type: none"> a. ECP's to improve the product performance and reliability beyond that required by the specification(s) cited in the contract. b. Value Engineering Change Proposals and Cost Reduction Proposals. c. Government-directed Engineering Changes. Expanded explanation: See MIL-STD-480 for categories of changes which, if unilaterally directed would be excluded from CECR. d. ECP's related to selected tasks, components, proven subassemblies, packaging, Government-furnished property or material or other areas that have been expressly excluded from the responsibilities of the contractor. Expanded explanation: Selected aspects of the TDP may be contractually selected tests, particular components, proven subassemblies, packaging, etc.,

Table A-1: Continued

Number	Key Term, Acronym and Definition
	<p data-bbox="483 573 1360 699">c. ECP's to resolve inconsistencies between the engineering drawings and performance specifications where implementation of the ECP would constitute a reversal of the provisions of the Order-of-Precedence clause. Expanded explanation:</p> <p data-bbox="483 741 1360 867">(1) Where the drawings take precedence over the specification(s), in the event of an inconsistency, a change to the drawings to facilitate attainment of specified performance levels would not be considered a change to correct a CD.</p> <p data-bbox="483 909 1360 1035">(2) Conversely, where the performance specification(s) take precedence over the drawings, in the event of an inconsistency, a change to the drawing to facilitate attainment of specified performance levels would be considered a change to correct a CD.</p> <p data-bbox="483 1077 1360 1245">f. ECP's related to defects in previously issued engineering changes of any category, provided the contractor has notified the contracting officer, within a specified number of days after approval of the ECP in question, of his unwillingness to assume CECR with respect to the subject approved ECP. Expanded explanation:</p> <p data-bbox="483 1287 1360 1350">(1) The issuance of changes is subject to the same propensity for error, omission, and discrepancy as the initial descriptions of requirements.</p> <p data-bbox="483 1392 1360 1549">(2) Yet a contractor cannot readily agree to warrant the suitability of future changes until he has an opportunity to review the changes. CECR would not be effective, therefore, until some manner of consent has ensued; of course, a Government implied warranty would prevail in the interim and the procuring activity may wish to assume responsibility for all such changes.</p> <p data-bbox="483 1591 1360 1751">g. ECP's involving substantial development of the details of the product design, unless: (i) the contract expressly requires substantial development of particular portions of the product; or (ii) the contractor is to assume all the uncovered risks inherent in its promised performance. Expanded explanations:</p>

Table A-1: Continued

Number	Key Term, Acronym and Definition
	<p>(1) Since almost any change to the TDP can be construed as a change to the "design," the word substantial is especially significant as a line of distinction between the respective responsibilities of the parties.</p> <p>(2) The acronym CD, as used herein, includes that which some users would perceive as "design deficiencies" but excludes deficiencies which would require substantial effort to develop portions of the product design.</p> <p>(3) Further definition of the word "substantial" as a broad or narrow line of differentiation would depend upon conditions peculiar to an individual contract.</p> <p>h. ECP's would be impossible or commercially impracticable to accomplish.</p>

APPENDIX B



DEPARTMENT OF THE ARMY
UNITED STATES ARMY LOGISTICS MANAGEMENT CENTER
FORT LEE, VIRGINIA 23801

S-30 May 1972

AMXMC-IR-PRO

5 April 1972

SUBJECT: Project IMPACT, Technical Data Package Improvement, Pre-Production Evaluation (PPE) Study

1. Reference teletype dated 14 January 1972, subject: AMC Improved Management of Procurement and Contracting Techniques (IMPACT) Program RCS AMCRP-113.
2. This office has been tasked to conduct a review and analysis of the approaches taken by each Major Subordinate Command (MSC), and selected Laboratories and Project Management Offices in the use of the Pre-Production Evaluation procedure described in AMCP 715-6. The purpose of the study is to determine the degree of success being achieved in the use of the PPE approach. Additional objectives are to determine pitfalls likely to be encountered in its continued use, conditions for continued use, and actions necessary by Headquarters AMC relative to standardization of the concept.
3. To assist the Army Procurement Research Office in the accomplishment of this task, you are requested to submit the information detailed by Inclosure 1 to the following address on or before 30 May 1972:

Director, US Army Procurement Research Office
US Army Logistics Management Center
ATTN: AMXMC-IR-PRO (Mr. Ken Griffiths, Project Officer)
Fort Lee, Virginia 23801
AUTOVON 687-6406.

Any questions regarding this request should be directed to the APRO Project Officer identified above.

AMXMC-LR-PRO

5 April 1972

**SUBJECT: Project IMPACT, Technical Data Package Improvement, Pre-Production
Evaluation (PPE) Study**

4. Please provide us with a point of contact within the organization charged with the responsibility for accomplishing this task as soon as possible.

FOR THE COMMANDANT:

**1 Incl
as**

**s/R. L. Schooling
R. L. SCHOOLING, J.D.
Director, US Army
Procurement Research Office**

APRO TASK 72-4

Preproduction Evaluation (AMCP 715-6)

Data Elements Guidelines

A. General Information.

1. This data elements guideline sets forth the desired details and types of commentaries requested from your organization. A problem statement and a functional definition of the PPE procedure are stated in paragraphs B and C below. Paragraphs D and E contain, respectively, 10 data elements related to the general organizational aspects of PPE utilization and 10 elements related to the specific contract experiences of your organization.

2. The guidance is intended to suggest rather than constrain the type and extent of information to be documented during your local analysis. One goal of the AMC-wide study is to surface all relevant and important aspects that may affect decisions regarding future AMC utilization of the PPE procedure. To attain this goal, a spirit of cooperation is solicited.

3. Upon receipt, the set of analyses will be assimilated by the APRO, analyzed further in an attempt to identify similitudes, anomalies, differences in approach and experience, reasons for differences, and so forth. Following the central analysis by APRO, a visit may be arranged with your organization to reconcile and clarify any differences in understanding, terminology, and viewpoints that may exist relating to PPE.

B. Problem Statement.

1. The Technical Data Package Problem (Paraphrased from Frankford Arsenal Regulation 715-38).

a. Technical Data Packages are generally intended to be suitable for unrestricted competitive procurement. However, supply contracts for production of military design equipment mission items of moderate to high complexity—especially initial production contracts—tend to be characterized by discrepancies, errors, or deficiencies in the technical data which may preclude practical manufacture or assembly, or which may preclude the attainment of required performance as set forth in the item specification.

b. A substantial number of residual errors, omissions, or controversial producibility problems can be expected to remain in a new Technical Data Package even after thorough checking by competent technical personnel. The number of these errors or problem areas will be significantly reduced by a carefully controlled prototype manufacturing and test phase, but despite all practical precautions, a substantial number of mandatory changes may be required during initial production.

c. In a competitive environment, the certainty of engineering changes in initial production tends to encourage "buying in" on a contract by bidders who hope to "get well" through the negotiation of these numerous changes. The possibility of getting well is enhanced by the noncompetitive nature of the negotiations which are often conducted under conditions adverse to the Government's bargaining position because of the alleged effect of the accumulated changes on contract schedules.

d. When otherwise qualified suppliers intentionally "buy in" on a contract with offers and bids which do not provide a reasonable margin of profit, contract administration problems increase, and the attainment of quality and timely delivery is invariably difficult. It can be expected that the contract price will rapidly escalate as the contractor attempts to recover his losses through the changes article of the contract, despite the best efforts of competent Government negotiators. Delays caused by the introduction of engineering changes have historically been one of the more serious problems encountered in initial production contracts. The time consumed in obtaining funds and in negotiating the cost of numerous engineering changes often results in continuing invalidation of contract schedules.

2. The Preproduction Evaluation Procedural Problem.

a. The basic PPE procedure requires the contractor immediately after award to perform a detailed review of all technical data furnished under the contract to identify any discrepancy, error, or deficiency in the technical data which may preclude practical manufacture or assembly, or which may preclude the attainment of required performance as set forth in the item specification. This review is required to be performed prior to, or in conjunction with his process planning, tool design, development of inspection plans and procedures, design of inspection equipment, and throughout the production and inspection phase of the contract.

b. A contract containing PPE provisions usually provides for the introduction of most of the necessary changes without additional cost to the Government, and without affecting contract delivery schedules. It serves to discourage the practice of "buying in" on a

contract, and to encourage the submission of proposals by the most qualified and most quality-conscious suppliers who otherwise would be subject to the unfair competition of intentional "loss-type" offers by offerors who have no intention of meeting their price and delivery commitments.

c. Guidance for use of the PPE procedures, however, has been essentially limited to the conceptual type discussion contained within AMCP 715-6. Separate major subordinate commands, laboratories and project managed organizations utilizing the concept, have developed differing sets of specific procedures tailored to accommodate local needs and interpretations.

d. The differences in procedural implementation include differing names of the technique, definitions of technical terms, criteria for use, contract provisions, solicitation practices, ECP and ECO dispositions, pricing techniques, and so forth.

e. Additionally, differing views prevail with respect to the applicability of the procedure, the reasonableness of the inherent transfer of risk to contractors, and the overall effectiveness of the procedure.

f. At this time throughout the AMC complex, the differing viewpoints and implementation procedures may be acting as constraints upon the full exploitation of the potential benefits or to perpetuate impractical methods of procurement. The question from a Headquarters point of view, is whether use of the PPE procedure should be continued and if so, how.

C. Definition. Preproduction Evaluation is a procedure used in firm fixed-price or fixed-price incentive production contracts in which the contractor is required to conduct a review of the detailed Technical Data Package and, thereafter, certify its suitability for his use in complying with all end item performance requirements. The contractor's certification takes the form of an agreement that he will meet the end items performance requirements after compliance with any revisions found necessary during his review. The contractor may depart from the detail technical data furnished by the Government if he can, as a result of his preproduction evaluation of the Technical Data Package, demonstrate an incompatibility in the design or technical data, in which case he is required to propose the appropriate corrective action. The distinctive feature of the PPE procedure is that any engineering change which may be found necessary in manufacture or assembly to enable the contractor to meet the requirements of the end item specification must be accepted without additional cost to the Government and without delay in delivery; i.e., without recourse to the changes article of the contracts.

D. Data Elements Relating to General Organizational Aspects.

1. A commentary regarding the nature of the problem at each organization to determine whether normal supply contracts (without PPF) have generally experienced significant cost growth and schedule delays in initial production of new material due to the actual or alleged effect of engineering changes. Examples, facts, and estimates applicable to a few selected contracts are solicited; the degree of detail to be included in the response is open to the discretion of the resposdee.

2. A commentary regarding the history of PPF utilization by the organization.

3. A list and physical attachment of the local policy and procedural guidance documents issued by the organization relative to the PPF process.

4. A commentary regarding the steps by which the organization decides to use the PPF procedure or conversely determines not to use it.

5. A commentary regarding the rationale for nonuse of the PPF procedure, if applicable. Detailed reasons why the organization has decided against the procedure are solicited—i.e., if the reason is substantive. If the reason is due to lack of emphasis or guidance, suggestions are solicited to enhance it. If the PPF concept was considered for use on certain contracts but decided against, the reasons for the decision are solicited.

6. A commentary regarding the general understanding and familiarity of the procurement and engineering personnel of the organization with the PPF concept—and the ascribed reasons for any “low level” of understanding, e.g., a lack of emphasis or publicity.

7. A commentary regarding the likelihood or probability of nonuse or continued utilization of the PPF procedure under appropriate circumstances, including use in other than initial production contracts, follow-on production contracts placed with the developer (via the “Certification of Technical Data” clause), and in follow-on competitive procurements of the same item.

8. A commentary regarding special problems and pitfalls experienced or envisioned.

9. Suggestions for conditions for continued use by the AMC complex and for Headquarters, AMC standardization of the procedure.

10. Suggestions for the improvement of the PPE concept, the Certification of Technical Data Clause, and for any other method of facilitating the transition of development items to production.

E. Data Elements Relating to Specific Contracts.

1. A description of the past and currently open contracts which contain PPE provisions, including general procurement history, contractors, end items, number of items procured, unit price, initial contract price, contract type, manner of solicitation, presolicitation conference, pre-award survey concern with PPE, general acceptance of PPE by offerors, primary objections of offerors, etc.

2. A description of the related data and procedural techniques used for each PPE type contract, including "break out" of PPE price as a separate line item, PPE price expressed as a percentage of hardware costs--or a subjective determination of PPE costs if not separately itemized, sample clause used (AMCP 715-6), total responsibility coverage as opposed to differentiation between responsibility for design and data errors, whether automatic ECP approval provisions were included and the specific time for approval, differentiation between essential and nonessential changes, and so forth.

3. A description of the results of each PPE type contract, including total number of ECP's approved, and the number and cost of Category I ECP's if any.

4. An estimate of the cost of Category II changes for each contract as compared with the probable cost of the same changes if they had been processed under the changes article.

5. An estimate of the schedule delays for each contract which would have resulted from Category II changes if they had been implemented under the changes article.

6. A commentary regarding the contract administration problems of each PPE type contract including--

a. Reservations of Government technical personnel as to their abilities to carry out their responsibilities such as ECP disposition and surveillance of PPE concepts.

b. TDP maintenance and drawing revision problems.

c. Post award contractor claims and an estimate of the justification or lack thereof.

d. Claims of "impossibility of performance" along with an assessment of the justification.

7. A commentary regarding the reasonableness of the allocation of risk in each PPE contract to both the contractor and the Government.

8. A commentary regarding the relative degree of Government-contractor cooperation and whether or not use of the PPE procedure helped in the subject contract to reduce the adversary relationship common in supply contracts.

9. A commentary regarding the quality of the selected contractor, including an assessment of whether the PPE procedure encouraged the participation of a more responsible contractor; and whether it enhanced the selection of a better source in the subject contract.

10. A commentary regarding the overall degree of success of the use of PPE provisions in the contract—i.e., whether it resulted in "out-of-contract" savings in time and money in the Government's administration of the contract, exclusive of the estimated "in-contract" savings by introducing ECP's into production without additional cost.

APPENDIX C

STUDY TEAM COMPOSITION

Frederick W. Helwig, Project Officer, Procurement Analyst, U.S. Army Procurement Research Office, Institute of Logistics Research, U.S. Army Logistics Management Center, Fort Lee, Virginia; B.A. in Economics, University of South Florida, 1963; Master of Commercial Science, Rollins College, 1970. Prior to joining the U.S. Army Procurement Research Office, Mr. Helwig was a Contract Negotiator (R&D and Production Contracts) with the Navy. He also has had similar procurement experience as a Procurement Officer and Contract Negotiator with the Air Force.

Kenneth D. Griffiths (former Project Officer; now with the Inspector General Office, HQ, AMC), Procurement Analyst, U.S. Army Procurement Research Office, Institute of Logistics Research, U.S. Army Logistics Management Center, Fort Lee, Virginia; B.S. in Marketing, University of Utah, 1958; MBA in Procurement and Contracting, George Washington University, 1970. Mr. Griffiths has published several research reports and co-authored an article, entitled "The Technical Data Package and Competitive Procurement," in the Defense Management Journal, April 1972. Prior to joining the U.S. Army Procurement Research Office, Mr. Griffiths was a Contract Specialist (R&D Procurements) with the U.S. Army Armament Command.

Kimrey D. Newlin, Economist, U.S. Army Procurement Research Office, Institute of Logistics Research, U.S. Army Logistics Management Center, Fort Lee, Virginia; B.S. in Physics, Guilford College, 1966; M.S. in Agricultural Economics, Clemson University, 1969; and M.E. in Industrial Engineering, Texas A&M University, 1970. Mr. Newlin has published several papers. Prior to joining the U.S. Army Procurement Research Office, Mr. Newlin was a General Engineer (Instructor), specializing in RAM and ILS in the Logistics Support Design Management Course, with ALMC.